The Magazine For Hewlett-Packard Enterprise Computing

HP Professional

JANUARY 1998

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Windows NT

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MPE/iX

A BCI PUBLICATION

HP-UX/WINDOWS NT INTEROPERABILITY

Bitten By X Windows?

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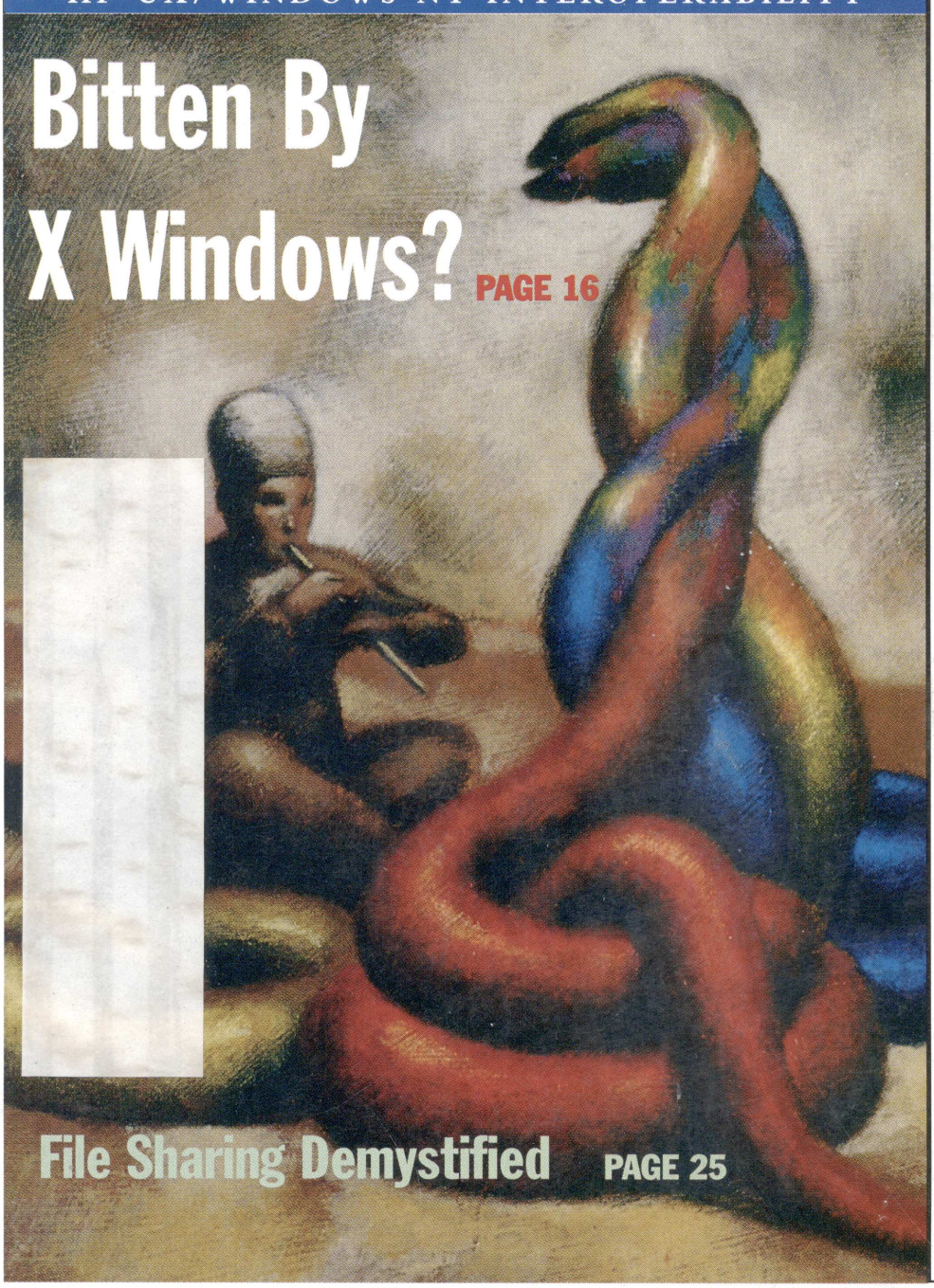

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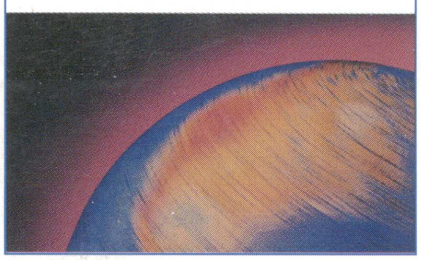

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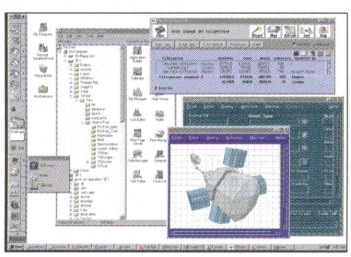

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Share And Share Alike 25

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File sharing between HP-UX and Windows NT only requires that the Network File System (NFS) be implemented on Windows or likewise, that Server Messaging Block (SMB) be implemented on HP-UX. Fortunately, we're sharing the tips and techniques for both.

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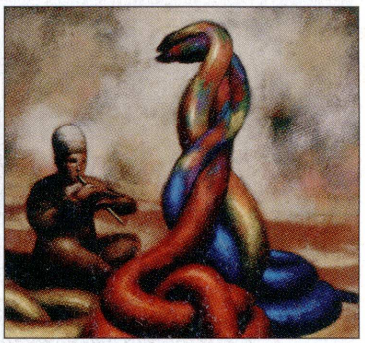

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World Beat: Dancing To An International Date Change 39

By John Harney

Hey! Wake up out there. It's another year closer to the Year 2000. But not everyone in the global village is ready for it. Millennium mambo, anyone?

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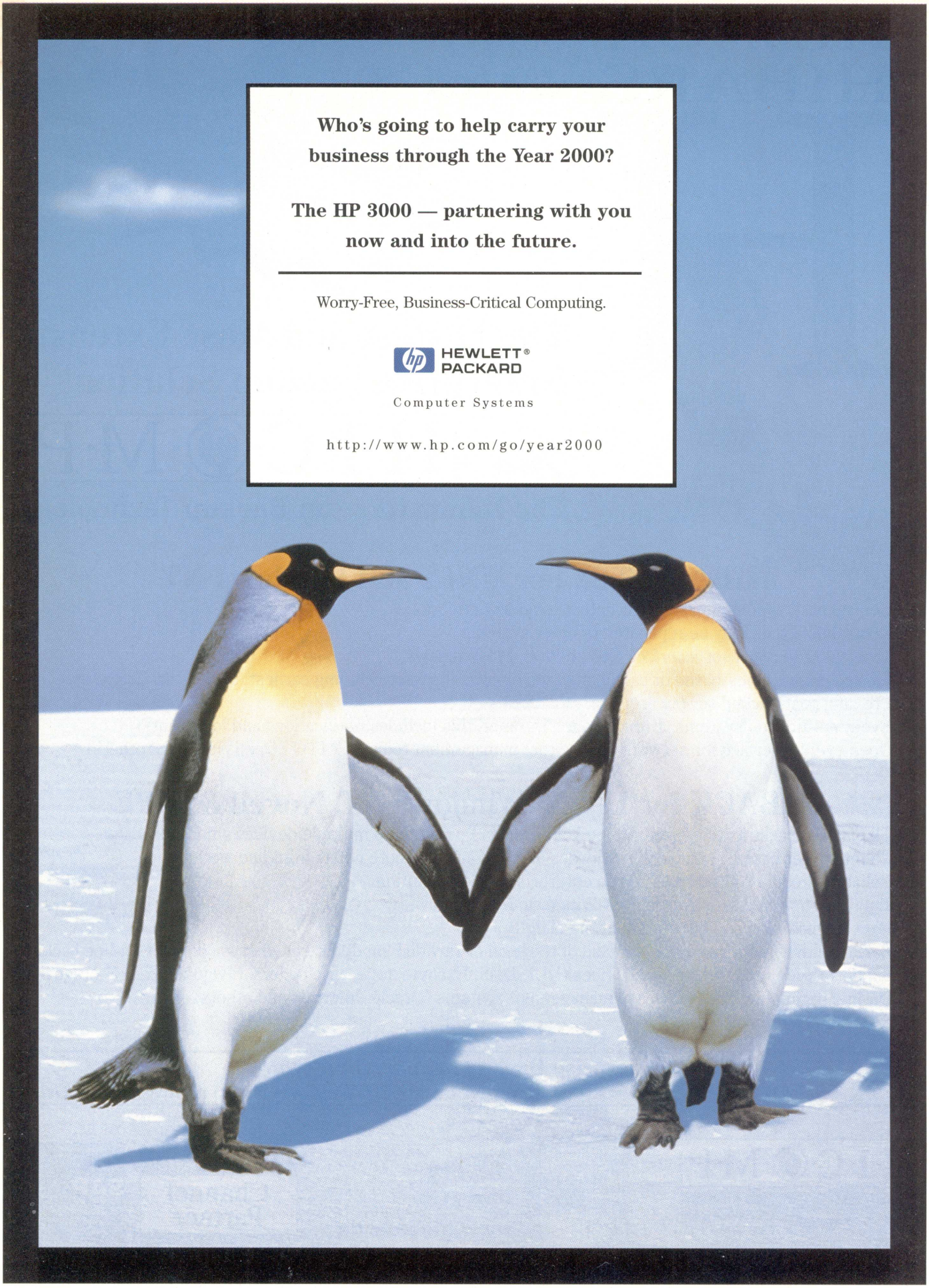
In our December issue, we inadvertently switched the titles of Jerry Fochtman and Tim Joseph. Jerry Fochtman is *Director of HP 3000 Development* and Tim Joseph is *Technical Manager/Support Manager, HP 3000 Division*. Look for their Year 2000 article on our web site (www.hppro.com).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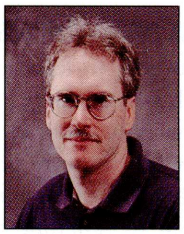

George A. Thompson
thompsonga@hppro.com

You hear a faint buzzing. It sounds far away at first. Then, as it seems to get louder, you realize it's the phone (or your pager, or your beeper, or your fax machine, or your PC). But by the time you read this, you now have less than two years, 104 weeks, 730-odd days, 24 months, 17,520 hours, 1,051,200 minutes, 63,072,000 seconds until the — need I say it — The Year 2000. Y2K. The next millennium. Happy New Year!

Like it or not, 1998 is not going to be about the impending Year 2000 disaster. Its like the computer industry equivalent of a made-for-TV disaster movie. Instead of Dick Clark in Times Square, on the eve of the Year 2000, network TV crews will be watching some federal government computer in Colorado ticking and clicking away the nanoseconds. The world will watch with bated breath to see if the collapse happens. Or will we all wake up in year 1900. For some of us, that might not be so bad. Things were simpler then, weren't they?

How much juice is in this disaster? That depends on whether you used the Year 2000 bug scare as an excuse to client/server-ize your enterprise. If so, good thinking. If you didn't, your 21st century problems are going to look suspiciously like the ones we've all had the last 100 years. Who said we wanted a revolution? When push comes to shove, don't we settle for slow, painful and random evolution — even if it kills us in the process. In the computer biz, it seems, life's a switch.

Our freshly minted *Migration Trends* survey says it all: you're primary platforms largely consist of HP-UX (64 percent), Windows 95 (54 percent) and Windows NT (58 percent). And you want more of the same (except for Windows 95) the next 12 months. And there are also significant drops in interest as IBM Sun and Digital as your primary platform. Despite the cutting edge headlines, it's s-l-o-w, painful evolution.

So, hey. Let's wake up out there. If you want to be on the cutting-edge, get with the UNIX and NT integration bandwagon. It might not be what you want to hear, but that's the story from the trenches. UNIX isn't dead, thank you very much. And Microsoft, despite the Justice Department's attempts, isn't going away. So, what's an IS manager to do?

Send us your war stories, that's what. We want to hear about how you're handling the realities of the new age. Are you stuck in a 20th century industrial, hierarchical mindset? Can your employees stop the production line? Or do they fear the reaper for trying?

Email me your stories about how you've dealt with the evolution of your systems within an HP environment. Are you reaching out for the 21st century in a big way? That is, do you develop and encourage the fires of innovation? Or do you snuff it out every chance you get — because it's never been done like that before.

The best stories will be published every month during the year and posted on our web site. So, the rest is up to you. Let's get together and start a revolution.

HP NEWS & VIEWS

DESK POTATO SOFTWARE SHOPPING

Too busy to leave your desk and deal with sales personnel who may not have answers to all your questions about a new HP software product you desperately need? Can't book a conference room to schedule the meeting? Bad weather or car trouble caused your sales rep to cancel after it took you weeks to set it up? Try connecting to www.software.hp.com, HP's new online software store that allows customers to purchase and download products after surfing through an electronic catalog.

Considered a significant step in their development in e-commerce capabilities, the site was developed in close cooperation with HP's existing distribution and reselling Channel Partners. It comes on the heels of the introduction of the HP Commerce Center (www.interactive.hp.com/hpcc), a Web site that allows small businesses to purchase network servers and printers online through the reseller channel.

http://www.software.hp.com

HP has provided thousands of customers with patches and software updates through its Web site over the past two years. The new software depot is currently selling HP-UX applications targeted at sophisticated end-users but expects to expand to

HP ISVS BEGIN EPIC CERTIFICATIONS

Calling their development efforts an "EPIC work-in-progress," PeopleSoft, Inc.'s Stan Swete, Vice President of People Tools Product Strategy is happy to have the opportunity to work with HP's Alliance Development Labs to plan for a smooth transition to future releases of their PeopleSoft human resources product. The Pleasanton, Calif.-based provider of human resource, financial, and materials management software runs on an Oracle database. The hope is that EPIC's memory management and parallel processing will enhance PeopleSoft's performance with improvements in processing speed and database access.

HP's leading ISVs have recently begun certifying their applications on HP-UX 11.0 as a jump-start towards optimizing them for future EPIC-based systems. EPIC (Explicitly Parallel Instruction Computing) is the technology jointly defined by HP and Intel that will allow software to communicate explicitly with a machine's processor when operations can be done in parallel. By reducing the number of fork-in-the-road decisions a program can make on which path to take, minimizing wrong path decisions, and reducing the time it takes for data to arrive at the processor after being requested from memory, it is hoped that EPIC will significantly increase performance over today's RISC and CISC technologies.

EPIC will be the framework for the much-discussed Intel Architecture 64-bit instruction set (IA-64). HP is hoping that by jointly developing the IA-64, they will have established a smooth migration path for their customers to take to the next generation of computing. Scheduled to begin production in 1999, the ultimate product to emerge from the joint venture will be Intel's Merced processor, the first to take advantage of IA-64. The Merced will be aimed at high-end workstations and servers.

Through its Designing the Future program, HP's Alliance Development Lab is offering a series of forums and developer tools to ISVs, all aimed at a seamless migration. Some Industry-leaders have taken the first step by working with HP's Development Alliances Lab and have begun to certify their applications under HP-UX 11.0.

"Supply chain management is an extremely complex application. Our customers need to process gigabytes of data to decide forecasting demands and manufacturing schedules," said Larry Roshfeld, Vice President of Technology for Manugistics, Inc., a Rockville Md.-based provider of synchronized supply chain management solutions. "64-bit based applications give us the ability to address more memory faster, and our performance benefits from the increased scalability and parallel processing EPIC will provide."

Roshfeld added that working with HP at this stage in EPIC's development gives them an advanced look at the technology's capabilities and provides them with a roadmap towards full implementation. HP is also rolling out EPIC planning services for end users aimed at integrating EPIC-based systems into the enterprise. The service is being provided through HP's worldwide Software and Services Group.

-Ken Deats, Associate Editor

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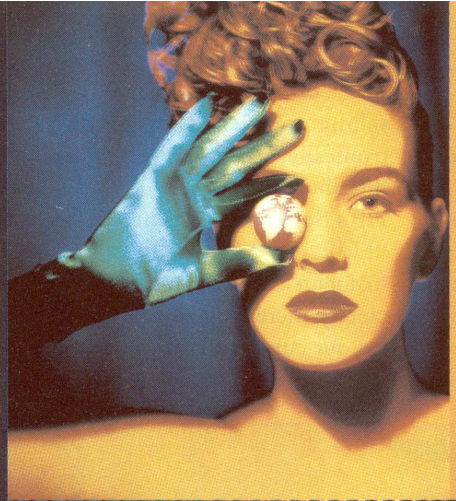

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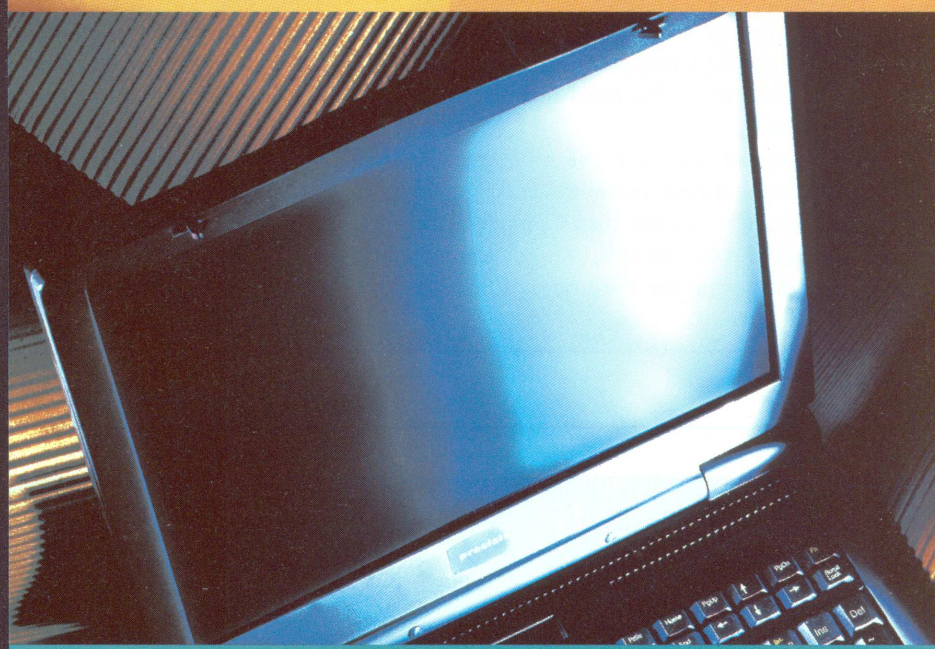


consumer and business marketplace products in the next six to eight months.

HP is promoting the existing channel infrastructure to enable value-added resellers to participate in this e-commerce hybrid model. "We feel it is integral to our business to empower our Channel Partners as we move into selling and delivering products electronically," said Harper Thorpe, U.S. distribution and reseller manager for HP's Solutions Reselling Organization. "Utilizing our existing channel will maintain customer intimacy while efficiently increasing add-on software sales for our current Channel partners."

COMPAQ GAINS THIRD QUARTER MARKET SHARE

According to industry research firm International Data Corporation (IDC), Compaq Computer Corporation stretched its overall market leading share to 18.8 percent in the third quarter, an increase of 5.5 percent over the second quarter.

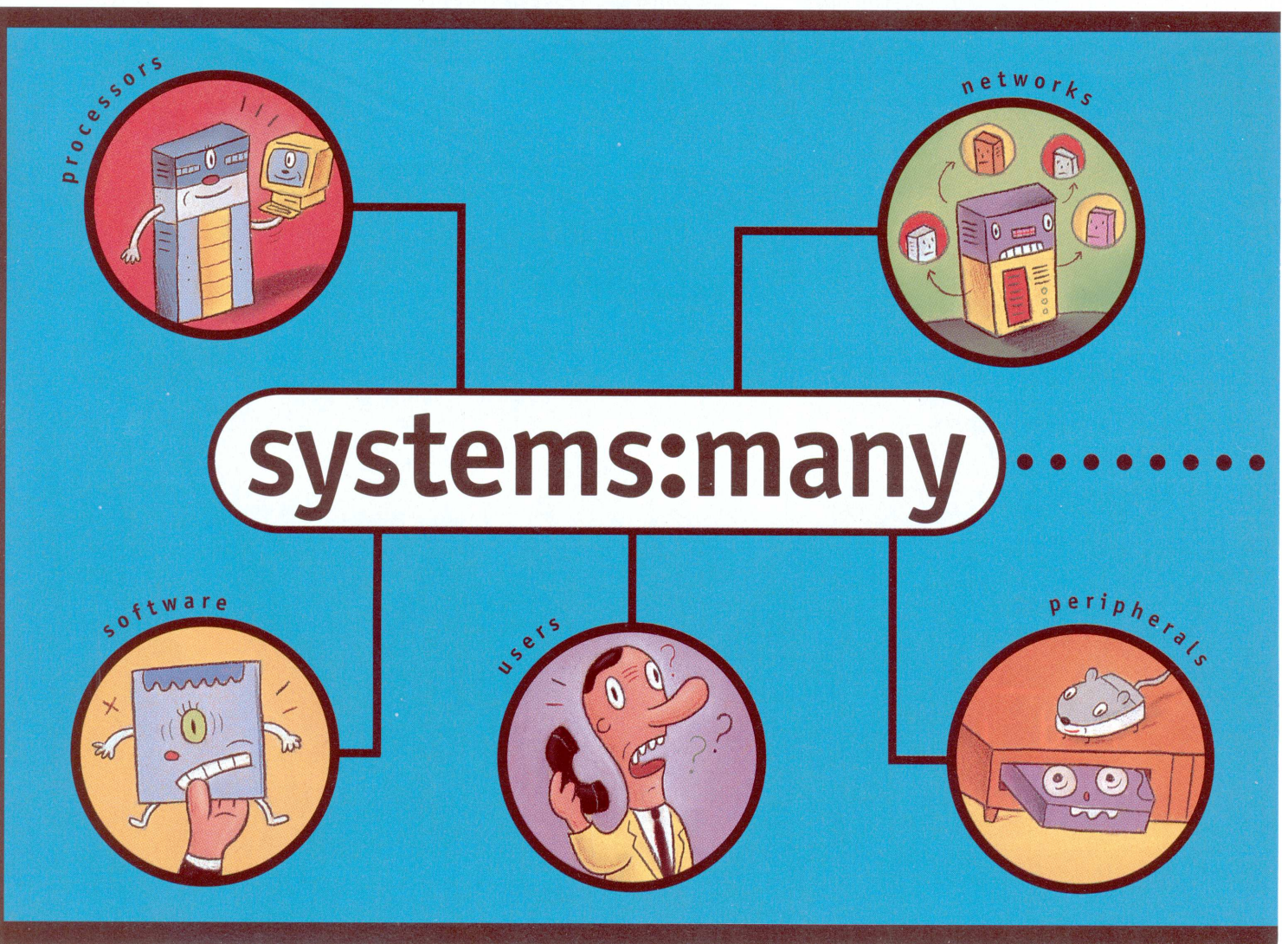
Compaq remained the most popular brand of desktops and PC servers in medium and large businesses and jumped to the number two spot in the portable market. IDC added that Compaq is the leading provider to small businesses, schools and universities, and government agencies. The total of 1.2 million units shipped during the third quarter represents a 68 percent growth from the previous quarter.

SARASOTA SUN SHINES ON UNICENTER TNG

Florida's bright sun may be setting on HP's OpenView. When the City of Sarasota in Florida went looking for a new centralized network management solution, they chose Computer Associate's Unicenter TNG over OpenView and IBM/Tivoli.

"OpenView is one of the tools we still use to manage logical devices," say Dan Dillon, Operations Supervisor for Sarasota's Office of Information Systems and Technology. "We still use it for jobs like resetting terminals and killing print jobs, but the scope is limited entirely to the HP 3000."

The city's small IT staff manages a growing network that consists of over 350 WindowsNT desktops on seven Novell LANs, TCP/IP connections to an IBM AS/400 used for utility billing services, and a HP 3000 that hosts records management, financial and



administrative applications. The complex topology forced large-scale integration to the top of the list of decision criteria for choosing the new network management tools.

"We see OpenView as a small piece of the framework," says Mary Scott, Director of Information Systems and Technology. "But Unicenter TNG is a suite of applications that can handle all the network components that need to be centrally managed."

OpenView, IBM's Tivoli and Unicenter TNG made it on the short list at decision time. Scott and Dillon both felt that Tivoli was too complex to integrate into their enterprise, and that OpenView's integration and scalability capabilities fell short. "We really had to look for a product that was not tied to any one manufacturer," says Dillon. "We are an environment that is changing dramatically."

To Scott and Dillon, several TNG features put the CA product over the top. They included: enterprise-wide backup, disaster recovery, agent-driven configuration, reduced network traffic, remote administration and job scheduling, the ability to remotely distribute software and a feature called Business Process Views.

TNG's Business Process Views enable network resources to be organized as components of a logical business process and presented to IT management in easy-to-understand 2D and 3D GUI displays. "We will use TNG's process viewing capability to identify situations and become more proactive, recognizing and resolving issues before they become big problems," says Scott.

Scott added that plans are being developed to roll out their technology services to surrounding local governments, businesses and agencies like the Chamber of Commerce, with hopes of eventually developing into a full-fledged profit center. TNG's asset-management capability is another feature that fits well into Sarasota's IT environment. "With so much installed hardware, we were looking for an efficient way to track everything we have deployed, plan for growth and work it all into a master plan for re-engineering and upgrades."

As with any IT manager, the bottom line for Scott and the city of Sarasota is reducing cost-of-ownership, improving staff productivity and eventually producing revenue. She hopes that with TNG "instead of spending time on routine maintenance and administration, my people will be able to focus on work that generates revenue."

Can't we all get along? Multiple computer systems, peripherals and software packages. Add to that LAN and WAN connections, Internet support and increasing numbers of demanding users. Throw in a problem or two, which needs several vendors to solve. And you've got a good picture of the demands on today's midrange IS manager.

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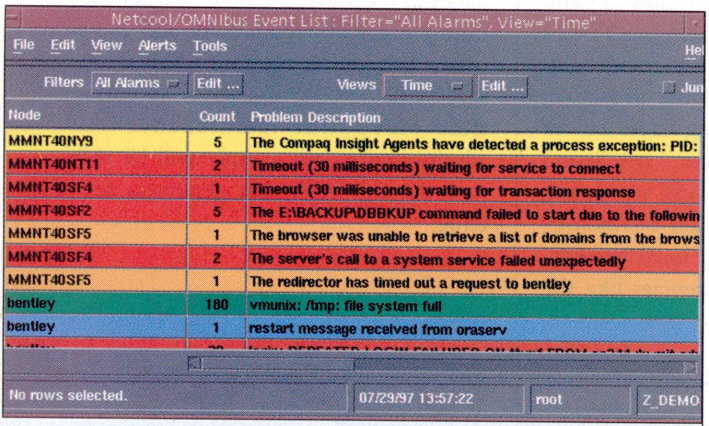
NetCool Heats Up Network Management



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When Internet service provider Mindspring Enterprises, Inc. (Atlanta, Ga.) created a state-of-the-art Network Operations Center to provide management of e-mail, Internet access, and Web hosting for its large customer base, network service-level management was a crucial concern. "Any kind of trouble can cause loss of connections for our customers," said Allen Thomas, Manager of Enterprise Development for Mindspring. "We must have a solution that sends an alarm when potential problems arise, immediately." With that in mind, Mindspring turned to Netcool/OMNIbus from Micromuse, Inc. as a solution.

At its core is the ObjectServer data repository. This real-time, memory-resident, SQL database server collects network event messages from a wide variety of sources and normalizes the data so that it can be manipulated by any network operators. Micromuse developed ObjectServer by combining an off-the-shelf Sybase client server with object-oriented techniques and other proprietary database tools.

Assisting ObjectServer are the Netcool probes; software interfaces that allow Netcool/OMNIbus to communicate with servers, databases, applications, and devices then push the information it retrieves into ObjectServer. Currently, Netcool Probes are available for more than 60 network elements and systems, including Cabletron Spectrum, Cisco StrataCom, HP OpenView, IBM NetView, and Windows NT. That diversity makes Netcool valuable for disparate networks.

Network information stored in ObjectServer can be manipulated through Netcool Desktop. With this user interface operators can view network data from a Unix/Motif front-end, any Java-driven Web browser, or a point-and-click Windows NT screen. They can then filter through the collection of events and create customized service views or EventLists. These EventLists, which can be viewed simultaneously by multiple operators, provide a macroview of an entire network or any component. EventLists can notify the appropriate operator when a fault occurs and help identify a problem.

Adding to the Netcool suite of service-level management products is Netcool/Reporter, a Java-based reporting tool that uses criteria filters to allow network managers to custom-define service levels from the OMNIbus store of enterprise-wide event messages. Using Boolean filters, customized or generic service-level reports can then be presented in several graphical formats, including spreadsheets, 2D or 3D charts, and billing forms.

The ObjectServer is priced at $25,000 and the Desktop interface for $7,500. The probes vary between $2,000 and $8,000. NetCool/Reporter Server is priced at $15,000, Administrator Client at $3,000, and Display Client at $1,000.

-Jeff Dodd, Contributing Author

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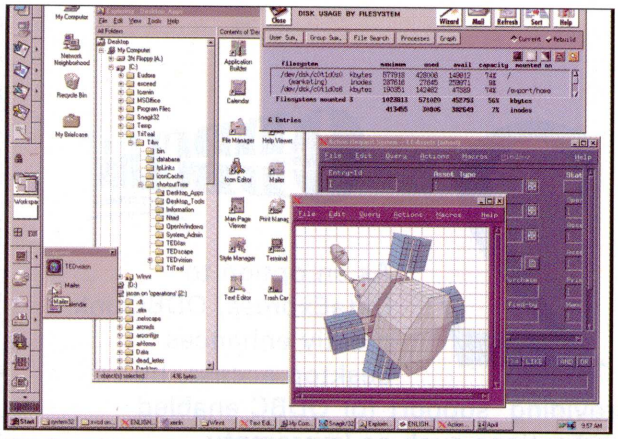
WinTED Does Windows With UNIX



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Windows 95 and NT workstations, UNIX servers, X-Windows access, FTP; all can add to the complexity of an administrators job. Seamless integration of any number of disparate resources across an enterprise to any number of impatient users can make an administrator's job feel exponentially more complicated. A new tool from TriTeal Corp. (Carlsbad, Calif.) provider of system integration software, may offer some much needed help.

Acting on the theory that the enterprise never throws anything away, and that UNIX applications tend to stay UNIX even as Windows evolves on the desktop, they recently announced WinTED 2.1, a Windows/UNIX integration product that enhances the ability to run UNIX applications from a Windows 95/NT workstation. WinTED 2.1 is an independent native Win32 application previously bundled with TriTeal's enterprise desktop (TED) product.

Features include full cut, copy and paste capability between windows, allowing movement of data from UNIX to Windows and vice-versa (i.e. populating an Excel worksheet from a UNIX file). In addition, WinTED provides for network drive remapping, making a UNIX server appear like any other network drive (i.e. X:), drag-and-drop functionality, and an on-demand X server. Also included is TriTeal's Graphical Workplace Manager which allows for simultaneous navigation between multiple windows.

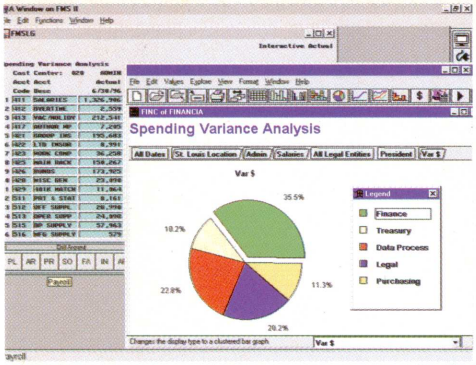
One major feature that sets this product apart from competitors, according to Chris Allen, Product Manager for WinTED, is the ability to administer desktop appearances remotely. Using a function called *automatic application gathering*, system administrators can designate common front panel designs, store those designs on a server, and allow individual workstations to copy them at logon. System administrators can provide groups of users with a common desktop look without having to visit each workstation.

Phil Serra, a Nokia UNIX Sys Admin has found WinTED to be a useful tool. "WinTED allows us to generalize the desktop so that users don't need to know where their applications reside." Serra added that he is also very pleased with WinTED's color and font mapping ability. In comparison shopping against the competition, specifically other X-Windows products, Serra agreed with TriTeal's Allen that the ability to centrally administer each workstation is one feature that sets WinTED apart. Individual configurations that generate icons for CAD applications at each workstations are easily maintained from a central server.

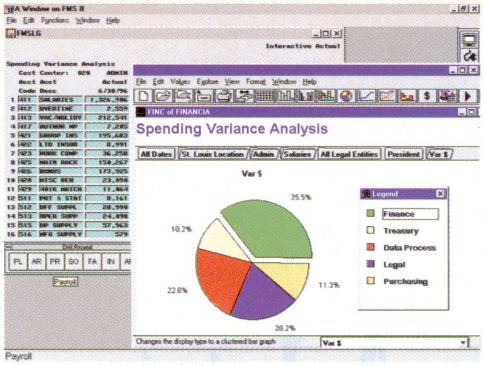
Allen also added that future releases of TriTeal products will fully integrate UNIX and NOS security from a single logon.

WinTED 2.1 starts at $99/seat and supports Windows 95 and NT; HP-UX; IBM AIX; SunOS; Solaris and SGI-IRIX. A no-risk download is available at http://www.triteal.com.

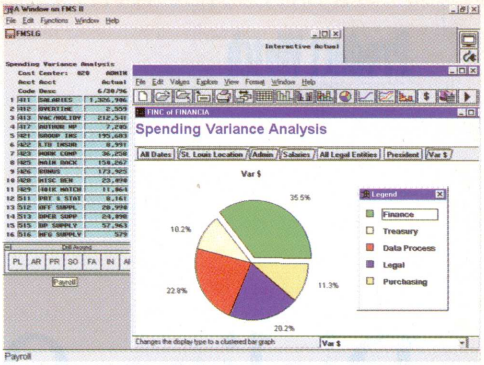
-Ken Deats, Associate Editor



HP 3000



HP 9000



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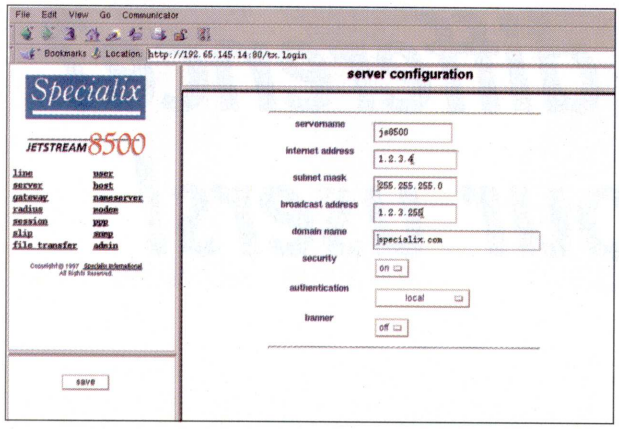

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As the Windows NT networking market expands, the need for remote access to hybrid UNIX/NT environments expands in kind. Traditionally, the high-end, high-volume segment of the market has been adequately covered by industry stalwarts like Cisco and Ascend. But, for the smaller scale, lower volume networks there has been a shortage of lower priced network access servers whose price doesn't vastly outpace benefits. That's the niche Specialix, Inc. hopes to fill with their newly released Jetstream 8500.

"Traditional UNIX market users are migrating to a UNIX/NT combination," says Ian Milne, CEO of Specialix, Inc. in Campbell, Cal. "They have a requirement for remote access to NT or UNIX legacy systems." The Jetstream 8500 allows up to 24 concurrent authorized remote users to dial into a network. Milne paints the ideal user as a salesperson on the road, dialing in for 10 to 20 minutes from a hotel room, checking e-mail, and dropping and printing orders on the system

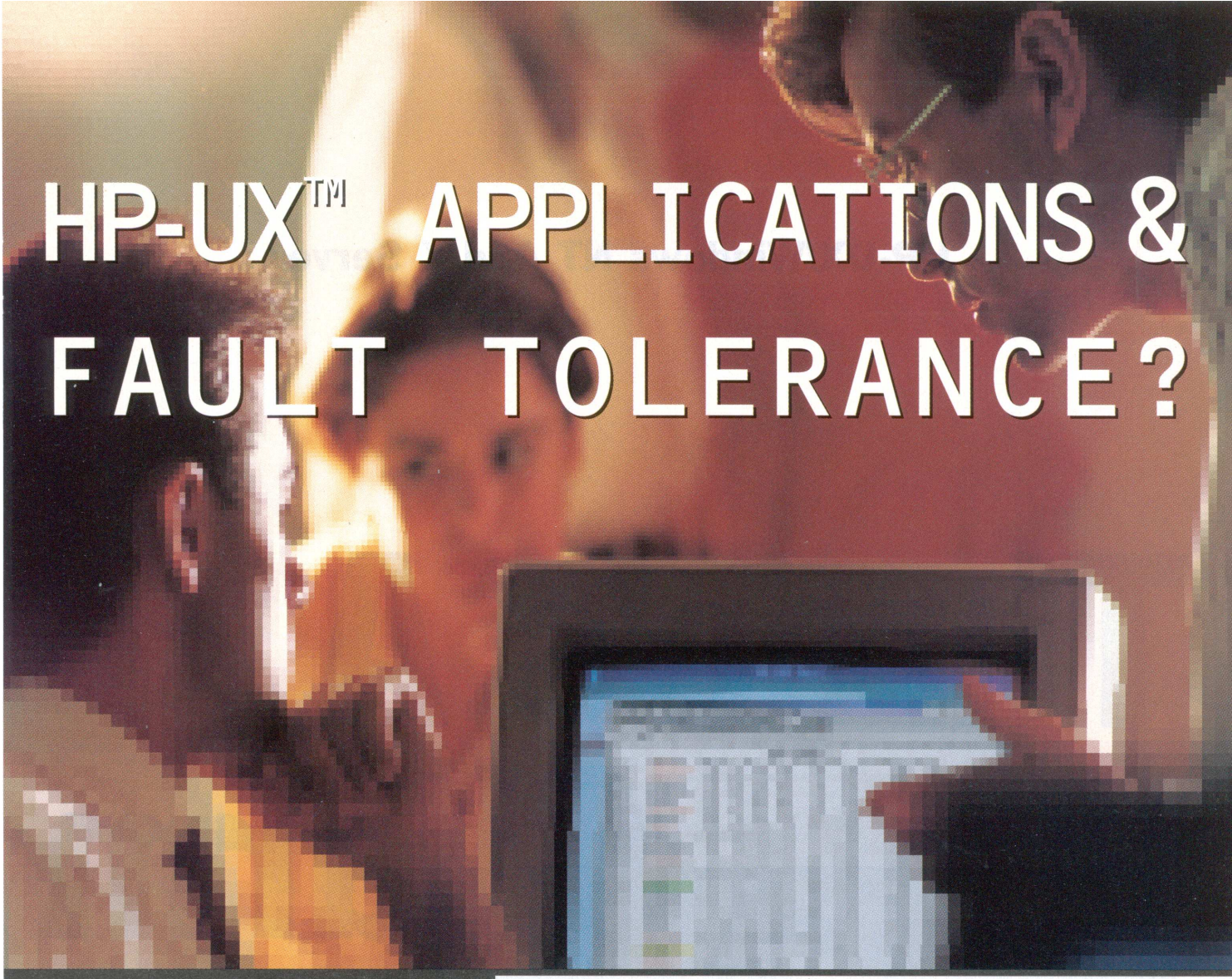
The Jetstream 8500 offers fixed and roaming call back that allows that salesperson to pre-determine authorized numbers. Passwords can be maintained for up to 32 dial-in clients, and, with its support of RADIUS (Remote Authentication Dial In User Service) protocol, larger networks can manage an unlimited number of users.

Bundled with the hardware is JETset, an advanced Web-based configuration and management utility. With JETset, administration of the Jetstream 8500 can be performed from a central host, over the network, via a Web browser or with the included command line and menu interfaces. From Windows 95 or NT, the software provides visual snapshots of network statistics, status, and password violations and can render 2D graphical output.

The system supports line speeds up to 230 Kbits/second and can accommodate both ISDN and analog users. Jetstream 8500 incorporates custom-built ASICS, that perform all point-to-point framing, thereby offloading remote client connection management tasks from the CPU. The server also provides enhanced port management capabilities through its host-based port emulation software. This feature allows for emulation of fixed port numbers for applications that require them.

Finally, managers of small networks are always concerned about component pricing. "The NT market is expanding faster than most people realized," says Milne. "We wanted to drive the price point down and not compete with the larger players." Following that philosophy, the Jetstream 8500/JETset package ranges from $1,495 for eight serial ports, up to $1,995 for 24 serial ports.

-Ken Deats,
Associate Editor



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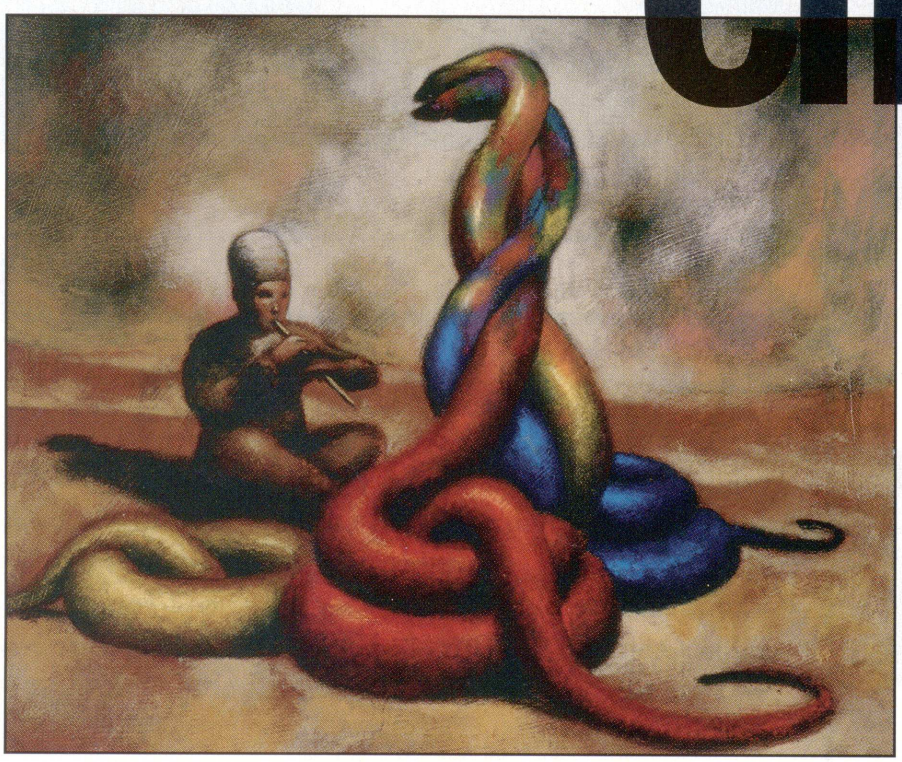

Marty Poniatowski

If you want to go beyond logging into a Windows NT system to perform Windows NT system administration and logging into an HP-UX system to perform HP-UX administration, then you need some way of getting access to one of these systems from the other. The X Window System is an ideal way to get remote access to an HP-UX system while sitting at your Windows NT system. While there are many fine X Server products on the market, however, I loaded Exceed 5 from Hummingbird Communications Ltd. (Markam,Ontario) on my system for demonstrating how X Windows can be used in a Windows NT and HP-UX environment.

After choosing *Xstart* from the

Running Into Potholes...

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Exceed menu, which allows you to establish an X Windows connection between your Windows NT system and HP-UX system, you specify the host to which you want to be connected, the user you want to connect to on the host, and the command to run on the HP-UX system. After you set up the *Xstart* window with the information you want, you can save the configuration. In my case, I'm issuing the **dtterm** command so I saved the window under this name. The complete **dtterm** command is:

```
dtterm-background white-display 159.260.112.113:0.
```

This command will start a **dtterm** window, which is a standard window program on HP-UX with a white background and display the window on the system at the IP address 159.260.112.113. The IP address in this case is the Windows NT system on which you are issuing the command which is the X Windows server. The ":0" indicates that the first display on the Windows NT system will be used for **dtterm** because in the X Windows world, it's possible to have several displays connected to a system. The system on which the command runs is 159.260.112.111. This is the HP-UX system which acts as the X Windows client.

When you click *Run!* from the pull-down menu, the **dtterm** command will be run on the host you have specified in the dialog box. Although you are typing this information on your Windows NT systems, this command is being transferred to the HP-UX you specified in the *Xstart* box. This will have the same result as typing the dtterm command shown on the HP-UX system directly.

When you hit *Run!* (from the Exceed menu), a **dtterm** window appears on your Windows NT system which is a window into your HP-UX system. You could use *Xstart* to run any program for which you have appropriate permissions on the HP-UX system.

The **dtterm** window has opened, the HP-UX manual for **dtterm** and one of the pull-down menus of **dtterm**. You could issue any commands in this **dtterm** window that you could issue if you were sitting on the HP-UX system directly. Keep in mind,

UNIX-TO-NT APPLICATIONS PORTABILITY

Will You Get A Migraine Or Just Migrate?

How can an IT organization move business critical UNIX-based applications over to the Windows NT environment smoothly, quickly and completely? Here's one method:

MIGRATING UNIX APPLICATIONS TO WINDOWS NT

Every useful IT application eventually outlives the original platform on which it was developed and deployed. There are too many new applications in the queue without adding the burden of costly re-writes every few years to address newer, faster hardware platforms. Therefore, re-writing applications for the latest platform every five years is not a viable option. However, application *source code portability* is one of the cornerstones of open systems.

If an application is written to a particular model of source-code portability, it should port easily to any platform. This portability model is usually based on source code standards such as POSIX and ANSI C, and specifications that include these standards such as the Open Group's Single UNIX Specification. The advantage of the open systems model hinges on preserving the investment in the application's development; it's not lost in the re-deployment to new architectures.

The Microsoft Windows NT POSIX subsystem is an exact implementation of the POSIX.1 standard interface and its required ANSI C library interfaces. As such, it did not provide the breadth that most real world applications require for portability. And the Microsoft POSIX subsystem was not particularly accessible as well, but it proved that the environment subsystem design was flexible and powerful. So, what if you could replace the Microsoft POSIX subsystem?

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though, that your access to the HP-UX system is based on the user you specified in the *Xstart* window. You could use *Xstart* to run any program for which you have appropriate permissions on the HP-UX system.

You are by no means limited to running only terminal windows such as **dtterm** and **xterm** under X Windows in this environment. You could perform system management functions as well. Another common use of X Windows software is for program development. Many users on the Windows NT system could get access to HP-UX servers using X Windows. Using X Windows on the Windows NT system to display applications running on the HP-UX system is powerful in this heterogeneous environment.

ADVANCED SERVER 9000: HP-UX REACHES OUT

Having Windows NT functionality on HP-UX would certainly be helpful too. HP-UX resources such as printers and disks could then be shared with several Windows NT systems on the network. That's where HP Advanced Server, an HP product that runs on your HP-UX system comes in. It provides Windows NT functionality that facilitates Windows NT and HP-UX interoperability. With Advanced Server 9000 your HP-UX system can act as a Primary or Backup Domain Controller, a file server, a print server, or other Windows NT functional component.

It's easy to install and configure Advanced Server 9000 on your HP-UX system. Advanced Server 9000 is installed using Software Distributor on your HP-UX system just as you would any other software. After installing Advanced Server 9000, you would run the configuration script called **asu_inst**.

After the installation is complete you have **netdemon** running, which is an essential component of Advanced Server 9000, as shown in the following **ps** command:

```
# ps ef | grep netdemon
        root 1100  1 0 10:18:38:7          0:00    /opt/lmu/netbios/bin/netdemon
#
```

In addition to **netdemon**, NetBIOS must also be running.

a proper telnet daemon and proper xterm to support remote access and management.

Consequently, application source code developed on UNIX systems ports easily to the OpenNT environment subsystem. All 80,000 lines of the X11-based jpeg/gif tool, xv, ported in a couple of hours. The application runs correctly as the environment subsystem approach allows the system service calls to have the exact semantics found on a UNIX system. The Win32-based porting library approaches fall short of the absolute semantics required to properly port complex applications.

For example, NTFS provides complete POSIX file system semantics like hard links, group ownership, and case-sensitive file names. The Win32 subsystem does not expose this functionality, but the OpenNT subsystem does. Real fork/exec semantics are provided through the OpenNT subsystem and the child process inherits the correct attributes of the parent. The OpenNT environment subsystem uses all the same communications mechanisms as the Win32 subsystem, so there is no appreciable performance penalty. All an end user sees is a desktop full of applications, each behaving and performing exactly as expected.

The OpenNT subsystem is cleanly integrated into the Windows NT world. The desktop is completely integrated, such that cut-and-paste works between OpenNT X11 clients displaying through the X11 server, OpenNT console applications, and Win32 applications. OpenNT subsystem applications can be launched from Windows desktop icons. Applications share the same NTFS file system, such that applications created by one subsystem can be accessed through the other. All the NTFS audit and security facilities can be applied to a ported UNIX application running on the OpenNT subsystem. OpenNT applications can execute Win32 applications, so shell scripts can be wrapped around Win32 programs. Traditional UNIX daemons can be ported to OpenNT and run as Windows NT services.

Large UNIX server applications can be ported to the OpenNT subsystem on Windows NT and the traditional client can be ported or re-written to have a Win32 GUI using Winsock to communicate to the server's sockets. The Apache web server —at 70,000 lines of code — ported in a few hours and any Win32-based or UNIX-based browser on the network could then reach it. Fortunately, the Windows NT architecture was designed to support multiple environment subsystems integrated with its functional subsystem to allow programs from different programming models to be simply ported. The OpenNT environment subsystem allows traditional UNIX applications code to be easily ported to Windows NT and the application to be cleanly integrated into the new environment.

Advanced Server 9000 starts several processes on your HP-UX system in addition to **netdemon**. You can also verify that the Advanced Server 9000 is running by viewing its processes with the **ps** command:

```
# ps -ef | grep lm

root 3285 1 0 10:37:19 ? 0:00 lmx.dmn

root 3200 1 0 10:37:57 ? 0:00 lmx.ctrl

root 3262 3200 1 0 10:37:07 ? 0:00 lmx.srv -s 1

root 3295 1 0 10:37:20 ? 0:00 lmx.sched

root 3289 1 0 10:37:19 ? 0:00 lmx.browser

root 1100 1 0 10:18:38 ? 0:00 /opt/lmu/netbios/bin/netdemom
```

Many process as shown above include the *lmx.dmn* which is the daemon, *lmx.ctrl*, which is the control process, *lmx.sched* which is the scheduler, *lmx.browser*, and *lmx.srv* which is a client session. If Advanced Server 9000 were not running, you would use the **net start server** command to start the server. Similarly, you stop the server with **net stop server**.

In addition, you have several users and groups that have been created on your HP-UX system to facilitate using Advanced Server 9000 with your Windows NT systems. In addition to the HP-UX system modifications that have automatically taken place, the Windows NT Primary Domain Controller (PDC) now recognizes the HP-UX system as the backup domain controller.

When I am working on the HP-UX system, I use the command line including some of the **net** commands, especially the **net share** command. When I am working on the Windows NT system, I'm using Windows NT functionality which is preferable to issuing commands on the command line.

Excerpted from the *Windows NT and HP-UX System Administrator's "How To" Book* by Marty Poniatowski, Hewlett-Packard Professional Books (Prentice-Hall). For more information, call (800) 382-3419 or go to www.prenhall.com

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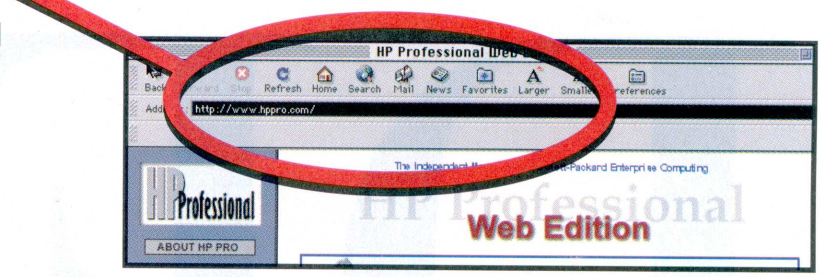

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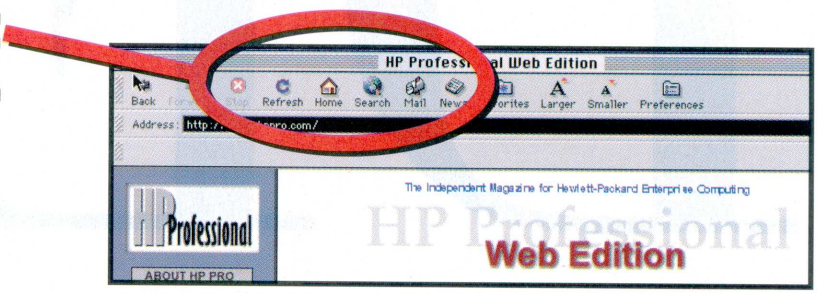

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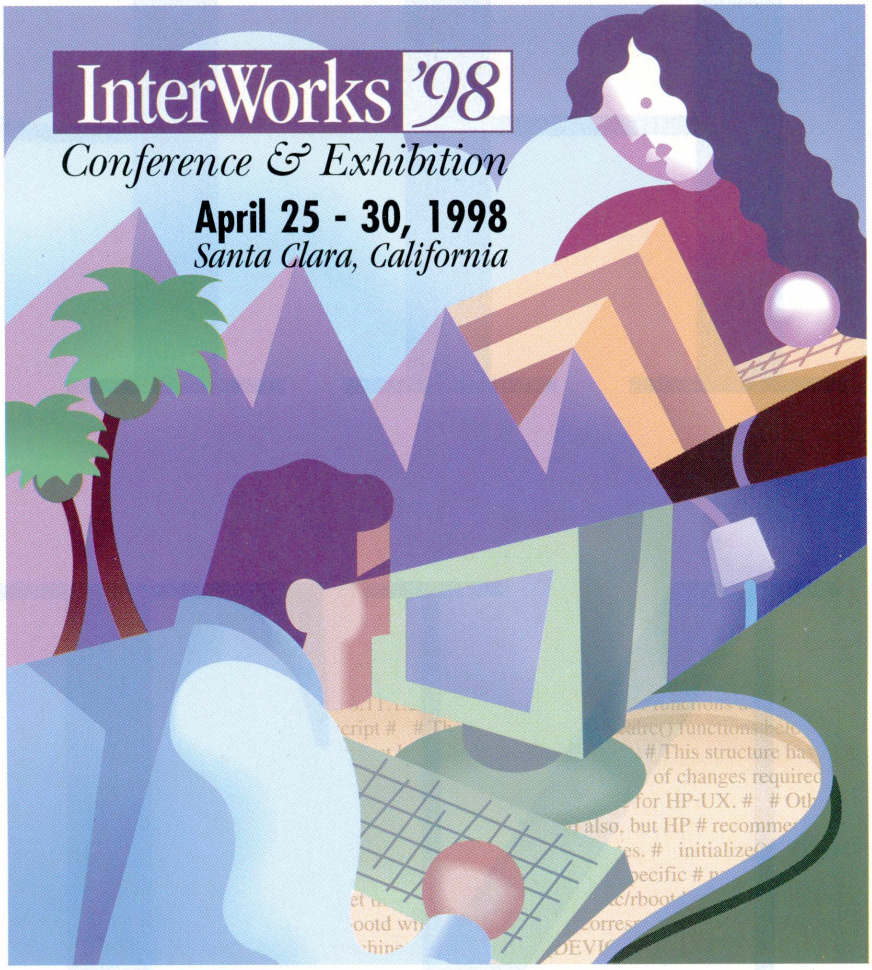

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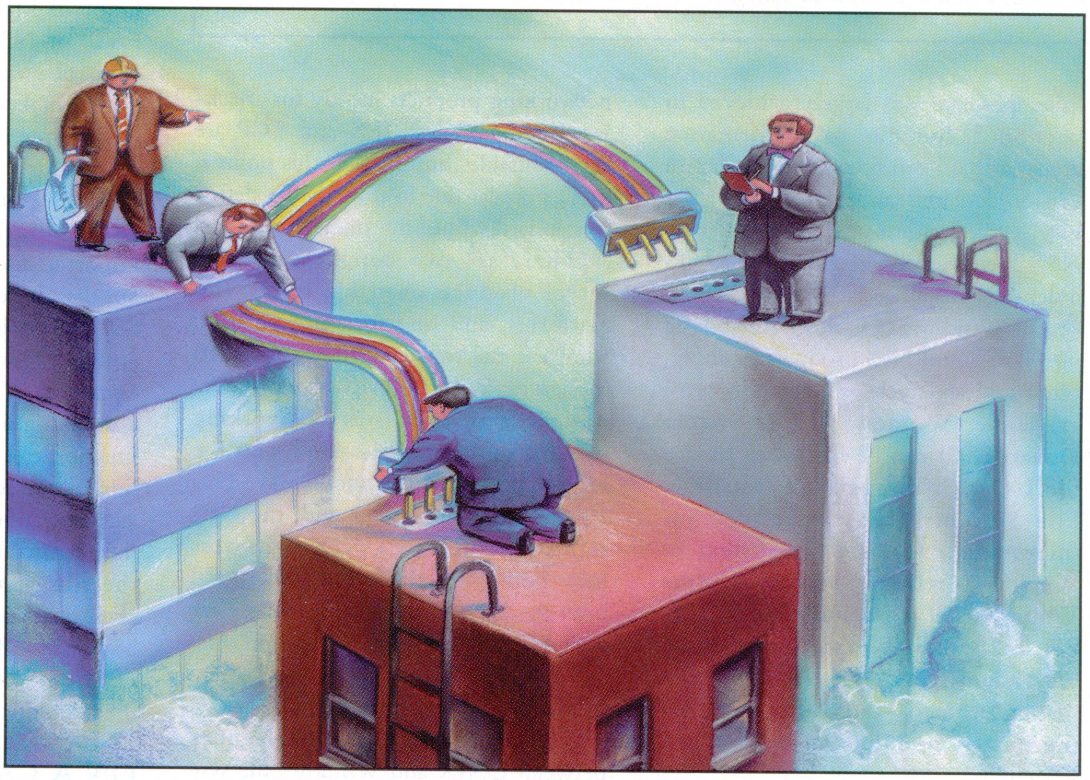
Share And Share Alike

Scott Werden



IT organizations have always needed to share networked resources such as files and printers among UNIX workstations and Wintel- based desktops (and now Wintel-based workstations), but the differences between UNIX and Windows NT operating systems raise at least a few interesting problems when it comes to file systems and file sharing.

For example, you may want to store- and run a Windows NT application on HP-UX. Luckily, file sharing between HP-UX (and most other UNIX OS'es) and Windows NT only requires that the Network File System (NFS) be implemented on Windows or likewise, that Server Messaging Block (SMB) be implemented on UNIX. NFS, actually developed by Sun Microsystems in 1983, is the native protocol for sharing UNIX files.

The protocol has been released as a Request For Comment (RFC) to the Internet community and is therefore considered an "open" specification. NFS is a relatively simple protocol, requiring only 21 procedures to be implemented. SMB, on the other hand, requires more than 200 procedures to implement.

Although NFS can be used with either TCP (Transmission Control Protocol) or UDP (User Datagram Protocol) as network layer transports, UDP actually seems to be the most common at this point. The NFS protocol only specifies procedures related to operations on a file system, such as input and output. Printing operations require different daemons.

The distinctive design features of NFS are indempotence (a guarantee of reliability) and OS independence. The

HP-UX AND NT PRINT SHOP

Printing is much more straight forward than file sharing. Windows NT supports lpr printing, so if a line printer daemon is available on the network, nothing more needs to be done. The lpr utility on NT does not allow applications to print directly; they must first send the print output to a file, then send the file through lpr. Software is available that allows lpr printing to be done directly from an application. Another printing option is to use an NFS related protocol: the PCNFS daemon (shipped with HP-UX). This requires an NFS client that supports PCNFS printing to be installed on the Windows NT workstation. Applications can print directly through NFS/PCNFS as well as Samba.

indempotence was largely achieved in version 2, but due to performance demands has been relaxed somewhat in version 3. The leakage of many of the UNIX file system characteristics into NFS has weakened the UNIX OS independence.

For Windows NT, there are about a dozen different NFS products available, often sold separately as a client or server. Under Windows, a File System Driver (FSD) can be loaded to service file I/O calls through the Installable File System (IFS) interface. So, importing a foreign file system to Windows is relatively easy. Within the Windows NT community, a distinction is commonly made between the server and client functions of a file sharing protocol, and the corresponding binary modules can be installed separately.

On the UNIX side of the equation, SMB is a Remote Procedure Call (RPC)-like protocol (a request is sent from a client and is answered via a server). Having its origins in Microsoft's DOS-based LAN Manager, SMB has since been extended to Windows 3.11, Windows 95/98 and is now the native protocol in all Microsoft Window NT products for sharing network resources, including both files and printers.

The low level protocol used to transport SMB traffic is flexible: the three most popular are NetBEUI, TCP/IP, and IPX. NetBEUI is not routable and is retained by Microsoft networking products mostly for backward compatibility. IPX and TCP are both routable, but TCP at this point is more popular due to it being the defacto standard within the Internet arena.

There are two commercial SMB server products available for UNIX platforms, and one freeware version. Samba is the free version of an SMB file server. With an SMB server, workstations with Microsoft Networking installed can gain access to files on the UNIX host, but not vice-versa. This asymmetry is not found with the NFS solution, since all UNIX platforms have both NFS client and server, and both the NFS client and the server are available for Windows.

CHEWING THE FAT

There are three key differences between UNIX and Windows file systems:

- **file permissions**
- **file names**
- **file locking**

These all have been the source of confusion and problems for users unaware of the differences between UNIX and Windows file systems. In general, this discussion applies equally to the two most commonly supported file systems for Windows NT: the File Access Table (FAT) and NT File System (NTFS). For the record, Windows NT can also use the High Performance File System (HPFS), a vestige from its OS/2 ancestry.

Historically, FAT was the file system for MS-DOS and has therefore set something of a standard in Windows NT and its Win32 API programming environments. For example, FAT file attributes are what's known as "Read-only, Archive, Hidden, System, and Directory" ("RAHSD"). These same attributes are also used within Win32, even when the more sophisticated NTFS is installed. In contrast to UNIX, these attributes apply across all users. However, this does not apply to files under NTFS that have been created or modified with a restrictive Access Control List (ACL). In the case of FAT, or NTFS with non-restrictive ACL, files are accessible to all users. So, it only makes more sense to use NTFS if one is concerned with security. It is much slower than FAT.

These characteristics of FAT or NTFS must be emulated by any imported file system, namely UNIX. So, the challenge for a NFS client or a SMB server is to translate UNIX access control ("rwx" for user, group, or owner) to Windows' file permissions in a meaningful way. Nevertheless, this situation can be avoided by a combination of correctly setting up the relevant administration files on the UNIX side (i.e., passwd and group), administrating the file sharing software — a NFS client running on the NT side, or perhaps a SMB server running on the UNIX side, while correctly handling the authentication of the user.

ON A CASE BY CASE BASIS

Within a Windows NT application attempting to access files resident on a UNIX host, file names often cause the most confusion. Unfortunately, Win32 is vague about the case sensitivity (upper or lower) used for file names, although the Win32 specification recommends application developers to assume the FSD is case-insensitive. NTFS retains the case of its filenames, but this is only meaningful if the Win32 layer presents NTFS with the case preserved. If Win32 retains the case, in principle, the underlying FSD could implement a policy of case sensitivity.

Unfortunately, the former is not always true; components of Win32 will sometimes lose the case of the name. Well written Win32 applications make no assumptions about the casing policy, and leave it up to the FSD to determine the casing policy. In this situation, FSD configuration parameters may exist to set what the policy will be. However, poorly written applications make assumptions about the case sensitivity policy — these will break when the policy assumed is in conflict with that of the FSD.

File name case sensitivity becomes a problem in the following situations: when files created by UNIX applications only differ in their use of the upper or lower case; or a Windows user assumes that by connecting to UNIX he will have all the benefits of the UNIX file system, including case sensitivity. If all files are being created and accessed from Windows, the latter will act in a consistent manner and there should never be a problem. Otherwise, the correct action is to "dumb-down" to the lowest common factor, which is the unreliable case handling of Win32, and simply assume case insensitivity.

Resource contention is handled differently between UNIX and Windows NT. Win32 offers two methods of file contention control: file sharing and file locking. File sharing essentially locks the entire file at the time it is opened, and has similar functions available on both platforms. Corruption will be prevented if both UNIX and Windows applications are trying to access the same file, as long as both use the file sharing technique.

LOCKING HORNS

File locking is fundamentally different between Windows NT and UNIX. Locking a file within Windows NT creates a lock that is mandatory; whereas locking within UNIX yields an advisory lock. A mandatory lock is one that does not require cooperating applications to protect a range of bytes. Once the lock is granted, any file I/O to that range by any other process will fail. An advisory lock requires all applications requesting access to a range of bytes to first ask the lock manager if the range is locked. It is then up to the application to refrain from accessing the locked range of bytes if an advisory lock is outstanding.

The end result is largely the same as for file name case sensitivity: if all file access is through Windows NT workstations, everything should work in a consistent manner and be OK. The exception to this is Windows applications that are written with the assumption that file locks are all mandatory locks; Microsoft Schedule, but not Word or Excel, seems to make this assumption. If files are being shared between UNIX applications and Windows applications, there may be difficulties depending on how the application was written.

A further complication related to file locking is the use of NT "op-locks." This is a method of asynchronous notification to all file system clients that any cached file data needs to be flushed. For instance, if a workstation has read in a file, the NT cache manager will keep an image of that file in its cache for some period of time. If the file archive is changed on the file server, an op-lock notification is sent to the client to tell it that its cache is dirty and to flush it. The NFS protocol has no support for op-locks, and although SMB supports them, the freeware Samba server does not implement them. If the file server is a repository for applications, op-locks are not a problem because executable images are read-only.

Scott Werden (scottw@wrq.com) *is the project manager for NFS Client development at WRQ.*

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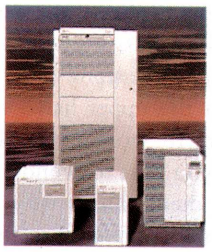

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Fred Mallett

You've Got To Express Yourself

The holiday season is always fun. For me, it's because I get to play board games with my young

nephews. It's an interesting experience because the rules are always changing: whenever I start to win, these five year olds always come up with a new twist in the rules to set me back.

So then, why is it that, in the past, I got so frustrated with regular expression usage? When you want to accomplish a text manipulation task, regular expressions are usually the quickest answer. However, if you always thought that the rules of the game of regular expressions change from command to command, and language to language. You're right!

Like my holiday board game playing with my nephews, we spend time learning the rules, then start playing with regular expressions. Only once we start to get the upper hand, something you expect to work correctly — doesn't. And you start to wonder if you understand them. That's why it's difficult to gain any confidence in the use of regular expressions. So, this is the first in a series of columns addressing some of the reasons for the disparity in regular expressions. More importantly, I'll tell you what you can do about it.

First, we'll tackle issues we face in becoming fluent in regular expressions. Because regular expressions is such a mouthful, let's start by referring to them as *regexps*. For those unfamiliar, a *regexp* is a program written in a language consisting of single, or sets of characters, that when compiled, will describe a text string of possibly varying length. When a regexp is given to a command as an argument (like **grep**, or used in a programming language (like **perl**), it will be applied to strings the program is manipulating, and return either a true/false if it matches, or, in other languages, might return the matched portion of the string, or might even address a portion of a string so that various tasks can be performed against that substring.

DIALECTS

Notice that I'm calling regexps a programming language. It's a good idea to think of them that way, because when a regexp is encountered by a program, it must compile the regexp into its meaning, then apply the regexp against some text. Also, just as there are many dialects in the English language, there are many dialects of regexps available in different commands and programs. For example, in **perl**, the useless regexp **(test)*** means zero or more occurrences of the four letters — t-e-s-t — in a row, like **test**, or **testtest**, or even nothing. In **grep**, this means an open paren, the letters t-e-s-t, and zero or more close paren characters, like **(test** or **test)** or **test)))**. To get the same functionality from **grep**, you would use the regexp: **\(test\)***.

STUFF IT

A different dialect of a language can drastically change the meaning of a statement. In America, you're "stuffed" after a Thanksgiving dinner, in Britain, it means something entirely different. There are many programs that accept regexps. A brief list would include editors like: **ex**, **vi**, **emacs**, commands like: **grep** and **sed**, and programming languages like: awk, tcl, perl, python, lex, and expect. Regexps are what provide the real text processing power in all these programs.

Within the dialects of regexps, there are two major categories: Basic and Extended. These determine which char-

FIGURE 1

Deterministic Finite Automation	Non-deterministic Finite Automation
•Often faster than NFA. •You do not need to write efficient regexps, speed will be the same, no matter how written. •Does not support backreferencing. (the ability to create dynamic expressions) •Always matches the longest possible match.	•You must write good expressions or speed will suffer. •Usually matches the longest match, but might not.

acters are treated special. As implied by the names, the extended has more special characters. As an example, **grep -E** and **awk** use extended regexps, but **grep** and **vi** do not. The problem goes deeper though. When you start getting into some of the other programs listed above, there are many characters beyond the extended set that start to appear if the author of that program decided to include them. Even worse, the meanings of even some of the most basic characters differs by program. For example, the **.** meta-character matches any single character except a new-line character in **perl**, **awk**, and **lex**, but in **vi**, it matches any single character, including a new-line.

A TALE OF TWO ENGINES

Another major category set of regexps are based on which search engine is used by a particular command. Among other things, this will determine the speed of searches, which capabilities are available, and even how the same regexp will match different things in the same strings. The two primary engines are **DFA**, and **NFA**. See Figure 1. Another category could be those tools that start with DFA, then change to NFA when needed (like GnuAwk). *Note that POSIX versions of commands that use NFA always return the longest match.*

Examples of commands that use the DFA engine are: **awk**, **grep**, **lex**. Examples of commands that use the NFA engine are just about everything else, including **perl**, **vi**, **sed**, and **tcl**.

As an example of the difference between these engines, and the longest match issue, consider these **perl** substitute statements:

s/(abba|a)/X/
s/(a|abba)/X/

If these were to act on the string **abbacadabra**, the first would change it to **Xcadabra**, whereas the second would change it to **Xbbacadabra**. This is because **perl** uses the NFA engine, and thus the alternation character (pipe), will accept the first possible match of 'a' or **abba**. But, with a DFA engine, alternation is greedy, which means it will always take the longest match. For example, the **awk** statements

A *regexp* is a program written in a language consisting of single, or sets of characters, that when compiled, will describe a text string of possibly varying length.

sub(/(a|abba)/,'X') or **sub(/(abba|a)/,'X')** would both do the same thing (change 'abbacadabra' to 'Xcadabra').

So, to learn regexps, and especially to become fluent in them, you must be aware that they come in many dialects. Next, you must learn the basics of what all the "funny" characters mean (**.*{}^$[]()\<\>\b+?|**).

Most importantly, you then move on to learning what combinations of these characters mean, as that is where the real power lies. Along the way, you must be careful about being aware that not all tools support all functionality.

Next month and beyond we'll do the basics of regexps, then the intermediate level usages, experimenting in several commands, and finally, get into looking at both powerful expressions, and writing efficient expressions. In the meantime, if you can't wait, buy *Mastering Regular Expressions*, (O'Reilly & Associates, Inc.) by Jeffrey E.F. Friedl. It's the most in-depth book about regexps I've ever read.

If your expressions are irregular, tell Fred as clearly as you can at fred@fame.com.

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Ryan Maley

Never Enough Of That NT Documentation Stuff

Not enough instructions, not enough indexes, not enough details. If you feel this way about your NT

documentation, then Windows NT Resource Kits are for you. Produced by Microsoft Press (mspress.microsoft.com), the publishing division of Microsoft the Resource Kits are designed to complement the NT documentation with additional in-depth information in both printed and electronic formats.

The Resource Kit(s) actually come in four "flavors": Workstation, Server and Server Supplements One and Two. The Workstation Resource Kit is a complement to the NT Workstation documentation. It consists of a 866-page book called the Resource Guide and a CD which contains utilities and an electronic version of the book. The Workstation Resource Guide is geared toward desktop operations, discussing topics such as planning for Windows 95 vs. NT and unattended installations.

RESOURCE RECOURSE

The NT Server Resource Kit consists of three printed manuals and a CD-ROM. The manuals are very good. The Server Resource Guide contains general information about NT which a system administrator will find invaluable. If your NT system goes down, you will want this book. The explanations of startup troubleshooting provide step-by-step instructions on such common problems as creating boot disks and recovering mirrored partitions. The Server Networking Guide explains an array of networking topics, from the basics of the OSI model to advanced domain planning, security and network monitoring.

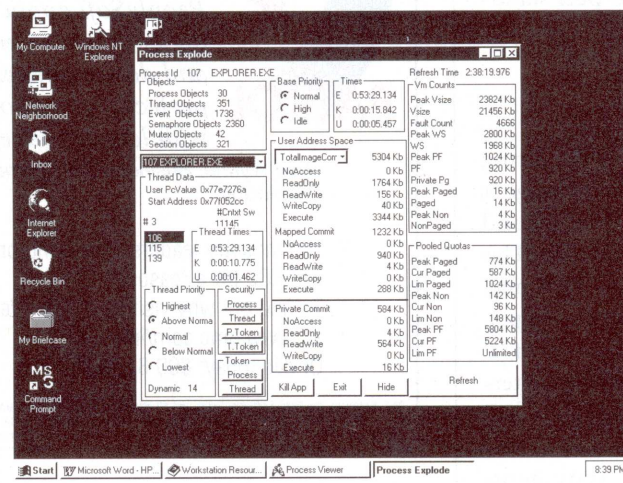
The Internet Guide contains information on connecting NT servers to the Internet, configuring Internet services like SMTP mail, and Internet Information Server, the web server provided with NT. Along with the complete manuals and Workstation Resource Guide, the CD contains nearly 200 utilities, some of which are explained later in this column. Installing the original Resource Kit CD requires a maximum of 49 MB of disk space.

Server Resource Kit, Supplement One consists of a new manual and CD. The manual covers new topics such as ISDN and Internet Information security and performance. The CD replaces the CD in the Server Resource Kit by updating some old utilities and adding new ones. Server Resource Kit, Supplement Two consists of two CDs. The first is another update to the original Resource Kit CD. The second contains a sample version of Technet, Microsoft's database of technical support articles. Supplement CD One requires 59 MB of disk space and Supplement Two requires a total of 60 MB for both.

HAVE A HEART

As you might have guessed, the resource kits are not for the faint of heart. If you want to know what happens while trying to resolve a NetBIOS name on a TCP/IP network (just for fun), you're ready for Resource Kit and the utilities contained therein. The utilities are provided as is, with the usual warnings about using them at your own risk. However, Microsoft does provide an e-mail address for bug reporting and "possible fixes" for problems you may report. Here are some reasons to take the risk.

Reg.exe is a command line tool to query and manipulate the registry



Process Explode displaying everything you want to know about the NT desktop process, Explorer.

included in Supplement Two. You can add, delete and query registry keys from the command line or from a batch file. For instance, the command *reg query hklm\hardware\description\system\centralprocessor /s* lists all the processors in your computer. I find myself making several changes to the registry every time I install NT.

For instance, I change the auto-disconnect time for Remote Access Service from the default of 20 minutes to 0. I now have a post-installation diskette containing **reg.exe** and batch file that makes my few changes using the req update command. The resource kit CD also comes with **regentry.hlp**, a comprehensive help file which defines all the registry entries. A great reference!

c2config.exe, the C2 Configuration Manager, will check your NT system for 17 key aspects of C2 security compliance. C2 is a level of security defined by the U.S. Department of Defense's National Computer Security Center in its Trusted Computer System Evaluation Criteria, popularly known as the Orange Book. That means Windows NT can be a C2 compliant system, if configured properly. For instance, if you haven't disabled the Guest account on your computer, *c2config* will let you know and offer the option of disabling it. This utility will not guarantee you a secure computer, but it will help you check on the most basic aspects of a secure system. The C2 Configuration Manager is included in the original Server Resource Kit and the two supplements.

RESOURCES

Windows NT Server Resource Kit Version 4.0
ISBN 1-57231-344-7 $149.95

Windows NT Server Resource Kit Version 4.0, Supplement One
ISBN 1-57231-559-8 $39.99

Windows NT Server Resource Kit Version 4.0, Supplement Two
ISBN 1-57231-626-8 $49.99

Windows NT Workstation Resource Kit
ISBN 1-57231-343-9 $69.95

KILL THAT PROCESS

pview.exe, Process Explode, provides extremely detailed information about a particular process. You can use Process Explode to view both physical and virtual memory allocations, change the process's base priority, kill the process and view and change permissions. This is a tremendous tool for software developers. While much of the information displayed in Process Explode can also be tracked in Performance Monitor that comes with the NT, Process Explode requires no setup and can also be used to manipulate processes as they run.

DiskProbe is a sector editor which allows those users with Administrator privileges to edit physical disk data byte by byte. It is very useful for repairing damage to the master boot records or the partition table. Because it is so simple to completely wreck your system drive, extreme care should be taken when using this tool. Instructions on how to use DiskProbe to perform such tasks as backing up and restoring the Master Boot Record are included in the NT Server Resource Guide. DiskProbe is in the original Server Resource Kit and the two supplements.

winat, the Command Scheduler, is a graphical version of the At command. It allows you to schedule command files to be launched at any time you specify. Command files can be scheduled to run at any time or nearly every interval. For instance, you can have a log file mailed to you every Tuesday at 2:00 a.m. Command Scheduler allows commands to be scheduled on any computer in the domain to help ease administration of remote computers. It's included in all the resource kits.

These utilities are a tiny example of the tools available in the resource kits. The kits are great products that belong in every system manager's toolbox. Aside from the obvious benefits of the documentation, the utilities included will make any system administrators job easier.

Ryan Maley is a Microsoft Certified Systems Engineer and the information systems manager for a midwest manufacturing company. He can be reached at ryan@maley.org.

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APPLICATIONS DEVELOPMENT

Red Hat Software Announces Release of Red Hat Linux 5.0

Red Hat Software, Inc. announced the release of Red Hat Linux 5.0, the latest update of the operating systems that can be used as a UNIX workstation for various applications running on the Intel, Digital Alpha and Sun SPARC computers. Release 5.0 includes new ease-of-use features including simplified installation, disk partitioning user interface, automatic hardware probing and configuration, sound support, Kickstart facility for system administrators and a new C library called Glibc. Red Hat Linux 5.0 includes configuration for multiple window managers, graphical user-level tools and updated tools for system administration. Internet audio broadcaster Real Audio, MetroX and BRU 2000-PE Backup and Restore Utility are also offered. Cost is $49.95 and includes 2 CDs, a manual, Real Audio, MetroX and BRU.

➤Red Hat Software, Inc., Research Triangle Park, NC at (919)547-0012.

Pictorius Ships iNet Developer 3.0 for Windows

Pictorius Incorporated released iNet Developer 3.0, a next generation intranet development tool for Windows 95 and NT. iNet Developer 3.0 includes support for Microsoft's Component Object Model (COM), allowing users to extend the power of iNet Developer using languages including Visual J++, Visual Basic, Visual C++ and Delphi. iNet Developer also includes support for Design Time Controls (DTCs) which are standard ActiveX controls that generate HTML code and are active only at design time. Spline Path Control, a sample DTC, is included with iNet Developer 3.0. iNet Developer also includes improved support of Dynamic HTML (DHTML), support for Scriptlets and data binding.

A complete installation of iNet Developer 3.0 for Windows 95 and Windows NT requires a Pentium or higher processor, 16 MB of RAM, 125 MB of hard disk space and a web server that supports ISAPI or CGI-Win 1.0 specifications. Cost is $1,495 which includes the site and page editor, the application server and the integrated programming environment. Pictorius iNet Developer 2.0 customers receive a free upgrade to version 3.0. A demonstration version is available from Pictorius' web site.

➤Pictorius Incorporated, Halifax, Nova Scotia at (800)927-4847.

STS Consulting Announces Salutation API Simulator

STS Consulting has announced the Salutation API Simulator, a software design tool for developers building Salutation device-to-device communications into applications. The Salutation Architecture is a protocol for locating and controlling computers, consumer devices and office equipment across the Internet or a company intranet. It allows an application to send a network query to locate a device, application or service then attaches the proper device drivers.

The API Simulator is a Windows 95 program that simulates Salutation Architecture API calls. It allows a developer mock up of a Salutation API interface and demonstrates the function provided and specific call attributes the API requires when the developer "points" at a button. It will run on an Intel PC with 8MB RAM and 3MB disk space. The API Simulator works in conjunction with the Salutation Architecture.

Single user licenses for the Salutation API Simulator are $150 with a suite license available for $1,500. A 15 day evaluation version is available at no charge. All versions can be downloaded at www.salutation.org/simulate.htm. The Salutation Architecture is available free of charge from Salutation Consortium at www.salutation.org/ordspec.htm.

➤STS Consulting, Highland, UT at (801)763-8216.

CYRANO Introduces WinScope 2.2

CYRANO, Inc. introduced WinScope 2.2, an application development optimizer that allows client-server application teams to write more efficiently. WinScope 2.2 has been integrated with CYRANO's automated testing environment to aid in reducing the risk of software failures. WinScope also provides developers with a way to navigate through applications, including full cross-referencing of every object.

CYRANO WinScope 2.2 is available for PowerBuilder development teams starting at $1,000.

➤CYRANO, Inc., Newbury-port, MA at (800)714-4900; (508)462-0737.

Bristol Technology Announces Wind/U 4.1

Bristol Technology, Inc. announced Wind/U 4.1, the latest version of its cross-platform development software. Wind/U 4.1 includes new support for ActiveX Template Library (ATL) and OpenGL. Support for Stingray Software's Objective Grid and Objective Toolkit MFC Components on UNIX are also included. With Wind/U 4.1, developers can write their applications on Windows 95 or Windows NT and deploy them on a wide range of platforms, including Windows, UNIX, OpenVMS and OS/390. Wind/U 4.1 runs on SunOS and Solaris; HP-UX; Digital UNIX; Digital OpenVMS; AIX and IRIX workstations. Cost is $12,000.

➤Bristol Technology, Inc., Ridgefield, CT at (203)438-6969.

PLATINUM Introduces ADvisor

PLATINUM technology, inc. introduced ADvisor, a decision support solution for managing the application development

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infrastructure. ADvisor is designed to enable managers and staff to proactively manage the progress of building and maintaining applications. ADvisor provides early warning of product trouble, ensures that the right resources are focused on high-priority projects, ensures that change requests are efficiently handled and monitors how well developers are reusing components. Features include more than 75 pre-configured information views, drill-down capability, hands-free proactive monitoring and browser-style navigation. ADvisor runs on Windows 95 and Windows NT.

➤PLATINUM technology, inc., Oakbrook Terrace, IL at (800)442-6861.

MicroStrategy Announces DSS Objects 5.0

MicroStrategy announced DSS Objects 5.0, an OLE API for custom application development and system integration. DSS Objects 5.0 provides a set of high-level, pre-packaged function and database calls that allow developers to customize their applications in standard programming languages. Developers can build applications that leverage the power and functionality of MicroStrategy's ROLAP server to generate multi-pass SQL, build data marts on-the-fly, drill-down on data and deploy applications across the enterprise. DSS Objects 5.0 is available on Microsoft Windows, Windows NT and Windows 95. Cost is $595 per named user with the purchase of DSS server; $995 per named user without the purchase of DSS server.

➤MicroStrategy, Vienna, VA at (800)927-1868; (703)848-8600.

Cygnus Solutions Releases GNUPro Toolkit 97R2

Cygnus Solutions announced the GNUPro Toolkit 97R2 release which includes Embedded C++ (EC++) support. The 97R2 release also includes new C++ support for member templates and improved exception handling. Other new features include: ISO/ANSI-conforming C and C++ compilers, macro-assembler, source-level debugger, binary utilities and libraries, member function templates, explicit qualifications of function templates, debugger support for debugging overlays, compiler support for global common sub-expression elimination (gcse) and flag for style violations based on "Effective C++" and "More Effective C++" by Scott Meyer. The GNUPro Toolkit is hosted on Solaris; SunOS; Windows 95; Windows NT; AIX; HP/UX and Irix.

The GNUPro Toolkit 97R2 release will be delivered to all Cygnus customers with current support contracts for native and embedded toolchains for up to five developers.

➤Cygnus Solutions, Sunnyvale, CA at 800-CYGNUS-1; (408)542-9600.

Frontier Technologies Offers The e-Lock Toolkit v.2

Frontier Technologies announced the e-Lock Toolkit v.2, a toolkit package designed to ease integration of secure messaging, security management and IP security (IPSEC). The e-Lock Toolkit v.2 is based upon standards including Secure Multi-purpose Internet Mail (S/MIME), Public Key Cryptography Standards (PKCS) and IPSEC. Included within the e-Lock Toolkit are the e-Lock Secure Messaging Toolkit, the e-Lock PKI Client Toolkit and the e-Lock VPN Toolkit. The e-Lock Toolkit v.2 is priced at $1,000.

➤Contact Frontier Technologies, Mequon, WI at (800) 929-3054; (414)241-4555.

Empress RDBMS Available For SCO UnixWare 2.1.2

Empress Software announced that Empress RDBMS is now available for SCO UnixWare 2.1.2. Empress RDBMS companion products including Empress ODBC Interface and the Empress Internet Applications Development Toolkit are also available for SCO UnixWare. Both Empress RDBMS and SCO UnixWare are designed for complex embedded applications in fields including telecommunications and computer telephony. Both are optimized for Internet environments. Empress develops an Internet applications development toolkit using standards such as HTML and TCP/IP; SCO uses the same standards to provide an operating system which offers components that ensure flexibility, security and ease of information flow within the Web environment.

➤Contact Empress Software, Greenbelt, MD at (301)220-1919.

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STORAGE

Hitachi Introduces Line of 3.5-inch Hard Drives

Hitachi America, Ltd. introduced a line of 3.5-in. hard drives with 18.2 or 9.1GB capacity and support for interface options such as Fast SCSI-2, Ultra SCSI, Ultra2 SCSI and Fibre Channel. The line includes the DK319H-18, which delivers 18.2GB of storage capacity in a half-height, 41.3mm profile drive; and the DK329-91, which delivers 9.1GB of storage capacity in a low-profile, 25.4 mm drive. Both drives use EPRML read channel electronics, embedded servos and advanced manufacturing technologies. The drives include an onboard RISC microprocessor. They have a disc speed of 7,200 RPM, average seek time of 7.5ms, average latency of 4.1ms and internal data transfer rates of 13.5-21.8MB/s. Each has a standard buffer of 512 Kilobytes, with an optional 2 Megabyte buffer to support caching intensive applications.

OEM samples of DK329H-91and DK319H-18 are currently available; production shipments will start during the first quarter of 1998. Sample pricing for drives with Fast SCSI-2 interface is $995 for the 9.1GB drive and $1,795 for the 18.2GB drive.

➤Hitachi, Brisbane, CA at (415)589-8300.

CLARiiON SHIPS 18GB, 7200 RPM Drives

CLARiiON announced the shipment of its 18GB, 7200 RPM drives. The new 18GB drives will be integrated into its SCSI Series 100, 1000, 20000 and Model 1900 TeleStor disk arrays; and into the fibre channel attached Series 3000 disk array. The drives have increased density and make it possible for 1.6 terabytes of storage to be configured in less than 5 square feet of floor space.

➤CLARiiON, Southboro, MA at (800)67-ARRAY.

Breece Hill Introduces DataIQ

Breece Hill Technologies introduced DataIQ, an automated tape library architecture. DataIQ is designed to maintain continuous data availability with a fault tolerant design that eliminates single failure points. DataIQ architecture can be adapted to any tape technology, and combines hot swap of components and customer serviceability. DataIQ is also able to resolve problems associated with tape drives when used in library applications should they occur, and incorporates the LaZerCaL adaptive positioning system.

➤Breece Hill Technologies, Boulder, CO at (303)449-2673.

Tecmar Announces Travan NS 20 Drives

Tecmar Technologies, Inc. announced the Travan NS 20 drive, which delivers 20 gigabytes of capacity at a 2 megabyte per second transfer rate. The NS 20 drive includes read-while-write data recording and hardware data compression features. It features a standard 2MB data buffer and is available with Fast SCSI interface. The NS 20 conforms to all Travan industry standards and provides backward read compatibility with NS 8 and TR-4 drives.Tecmar's Travan NS 20 is currently available for OEM evaluation. Volume shipments are scheduled for the first quarter of 1998, with an MSRP of $649 for an internal unit.

➤Tecmar Technologies, Inc., Longmont, CO at (303)682-3700.

Luminex Announces NET-CDR

Luminex Software, Inc. announced its NET-CDR network enabled CD-Recording solution. The NET-CDR is based on the Fire Series for UNIX software and provides automated CD based software publishing, distribution, duplication and information archiving. The NET-CDR supports recording and retrieval of ISO 9660, Rockridge, Joliet and Macintosh HFS formatted CD-ROMs. It can be used in nearly every network environment by supporting SUN, SGI, HP and IBM servers.

The NET-CDR includes everything needed to record CDs from a UNIX workstation: the Fire Series Software, quad-speed CD-Recorder, hard disk and blank media. The MSRP is $4,995.

➤Luminex Software, Inc., Riverside, CA at (888)LUMINEX.

Veritas Introduces Storage Manager, Storage Advisor and Storage Planner

Veritas Software Corporation introduces three new products designed to provide customers with policy-based centralized management of heterogeneous, UNIX and NT storage resources and maximum business continuity. The three products are Veritas Storage Manager, Veritas Storage Advisor and Veritas Storage Planner and comprise VERITAS' Intelligent Storage Management product set.

Veritas Storage Manager provides the central management interface from which distributed storage objects can be monitored and managed. Storage Advisor provides system-wide configuration analysis and recommends storage layout changes to optimize system performance. Storage Planner, a predictive storage resource analysis tool, enables easy forecasting of future storage needs. Veritas Storage Manager will be available in the first quarter of 1998. Veritas Storage Advisor and Veritas Storage Planner will be available later in 1998.

➤Veritas Software Corporation, Mountain View, CA at (650)335-8000

Cybernetics Offers AIT Tape Libraries

Cybernetics now offers automated tape libraries to support AIT tape drives. The models feature 12 to 126 tapes and up to six CY-8000 drives for storage capacities ranging from 300GB to 15.75TB. A single CY-8000 subsystem can store 25GB at 3MB/s; with Cybernetics 5:1 data compression, the AIT subsystem can store up to 125GB per tape and transfer data at speeds of up to 9MB/s. A 16Kbit EEPROM chip mounted into the data cartridge, known as Memory-In-Cassette, provides an index of stored information and a file access time of less than 27 seconds. With multi-host connectivity, one library can serve up to four different host systems with predefined drives and tape slots reserved for each host. The Advanced SCSI Processor (CY-ASP) expands a multi-drive library into a total data management tool with striping, mirroring and off-line copy/verify modes. Information security can be added with the optional card-key Data Encrytion.

➤Cybernetics, Yorktown, VA at (757)883-9990.

DATA WAREHOUSING

Optimal Networks Integrates With Cabletron's SPECTRUM Data Warehouse

Optimal Networks Corporation announced the integration of its entire product family with Cabletron's SPECTRUM Data Warehouse. This integration delivers application-level data mining which uncovers patterns and correlations within applications and the enterprise network. Optimal Application Insight will feed application level information into the warehouse and application level error and performance management traps into SPECTRUM. Optimal Surveyor and Optimal Performance will extract correlated network and application information from the SPECTRUM Data Warehouse to enable enterprise-wide capacity planning. Optimal Application Expert can be launched from SPECTRUM Enterprise Manager.

SPECTRUM Data Warehouse is an SQL-based, open architecture that supports Oracle, Sybase and Microsoft SQL Server databases. Platform support, available as an add-on application with SPECTRUM 4.0 rev.3 and higher, will include the Sun Solaris and Microsoft Windows NT systems. SPECTRUM Data Warehouse will be available during the first quarter of 1998.

➤Optimal Networks Corporation, Palo Alto, CA at (650)845-6333.

MESSAGING / GROUPWARE

JE Software Enables E-Mail Access By Telephone With JE Mail-Call

JE Software's JE Mail-Call enables one to listen to e-mail messages by touch-tone or cellular telephone without the use of a computer. By dialing into a central server and entering a confidential Personal Identification Number (PIN) one can listen to e-mail messages and have them automatically sent to any fax machine. E-mails stay in your computer's in-box so that they can be processed further upon return to your computer. Subscriptions start at $30 for 3 months, $54 for 6 months or $99 for 12 months. A 30 day trial subscription is also available for $10.99. Free demonstrations of JE Mail-Call are available by dialing (888)462-4348 or (913)438-4858 (outside of USA).

➤JE Software, Mount Vernon, NY at (914)699-6710.

NovaSoft Systems Ships NovaWeb/Approve

NovaSoft Systems, Inc. shipped NovaWeb/Approve, a fully Java-based, integrated document and workflow management system. NovaWeb allows business managers to keep track of their organization and user base because task definitions, workflows and time triggers can be developed and adapted without complex programming or assistance from IS. Features include document and folder manipulation, participation in workflows, document check-in/check-out, and annotation and review of workflow status in graphical or tabular form. Users can work with popular browsers and any HTML editor to create or modify their Web pages. Cost is $700-$900 per user with quantity discounts available.

➤NovaSoft Systems, Inc., Burlington, MA at (617)221-0300.

AY Mail v.1.3 Released

Andrey Yastrebov has released version 1.3 of AY Mail for Windows 95 and Windows NT. AY Mail enables one to send e-mail to many people, send out a resume, distribute binary files and create a newsletter. Up to 20 binary files may be attached to a message using MIME, Uuencode, XXencode or BinHex. Everything sent may be saved for future use. AY Mail can send up to 5000 messages per minute using a 33.6K modem; and can send 20-30 customized messages per minute. An AY Mail Individual License is $24.95; site license is $299.40. Evaluation copies are available upon request.

➤Andrey Yastrebov, Littleton, CO at (303)972-7808.

NETWORK MANAGEMENT

HP Integrates Desk-Top Management Solutions With CA's Unicenter TNG Framework

Hewlett-Packard Company and Computer Associates International, Inc. (CA) announced that HP has integrated its desk-top management solutions, including HP TopTools, NetServer Assistant, HP JetAdmin and AdvanceStack management products, with CA's Unicenter TNG Framework. The union will allow Unicenter TNG to automatically identify HP systems and incorporate them in Unicenter TNG's enterprise-wide policy and Business Process Views. HP's full line of desktop systems and hardware components can now fully exploit Unicenter TNG's end-to-end management capabilities without any required additional integration.

It supports the full portfolio of desktop management standards and is the foundation for Unicenter TNG. HP TopTools is a DMI-based management solution allowing users and administrators to gather the attributes available from DMI-enabled PCs and manage them locally and remotely. HP TopTools also predicts hardware failures, diagnoses hardware problems and enhances the integration of desktop control functions with customers' existing IT management facilities. The Unicenter Framework is now being shipped with HP's Intel-based HP NetServer L Series systems. The integration code can be downloaded from HP's Web site at www.hp.com/vectra/manage.

➤CA, Islandia, NY at (516)342-5224.

Computer Associates Announces Remote Control Option For Unicenter TNG

Computer Associates, Inc. (CA) announced the Unicenter TNG Remote Control Option software based on the Remotely Possible/32 products developed by Avalan Technology, Inc., a CA-owned company. With the Remote Control Option, operators can monitor multiple PCs for quality assurance. Benefits of the integration between Unicenter TNG and the Remote Control Option include the ability for help desk administrators to resolve users' technical problems remotely, the ability for administrators to manually inspect a local hard disk to directly locate a software deliv-

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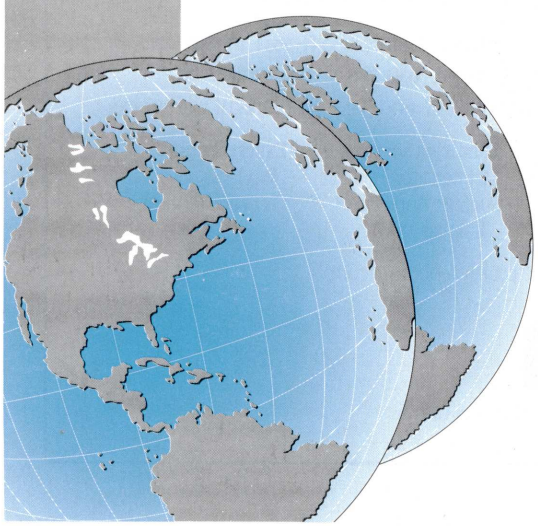

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ery problem, the ability for managers to remove unauthorized software installations detected by the Asset Management Option, the ability to control Unicenter TNG consoles from remote machines, and the ability for companies to transport data from off-site locations during off hours. The Unicenter TNG Remote Control Option operates over TCP/IP; IPX; NetBIOS; and direct modem dial, providing full functionality across LANS; WANS; modems; and the Internet. It supports Windows NT (Intel and Alpha), Windows 95, Windows 3.1 and DOS platforms.

➤Computer Associates International, Inc., Islandia, NY at (516)342-5224.

Hummingbird Introduces NFS Maestro Gateway

Hummingbird Communications Ltd. announces NFS Maestro Gateway, a high-performance kernel-mode Windows NT NFS-SMB proxy server. NFS Maestro Gateway allows desktop access to NFS resources by Windows PCs without necessitating the installation of PC-based NFS clients. NFS Maestro Gateway is compliant with NFS Version 3 (IETF RFC 1813), supports WebNFS (IETF RFCs 2054 and 2055) and can automatically detect the presence of NFS versions 2 and 3 and WebNFS on the file server. Included with NFS Maestro Gateway is Jconfig, Hummingbird's Java-based application management system.

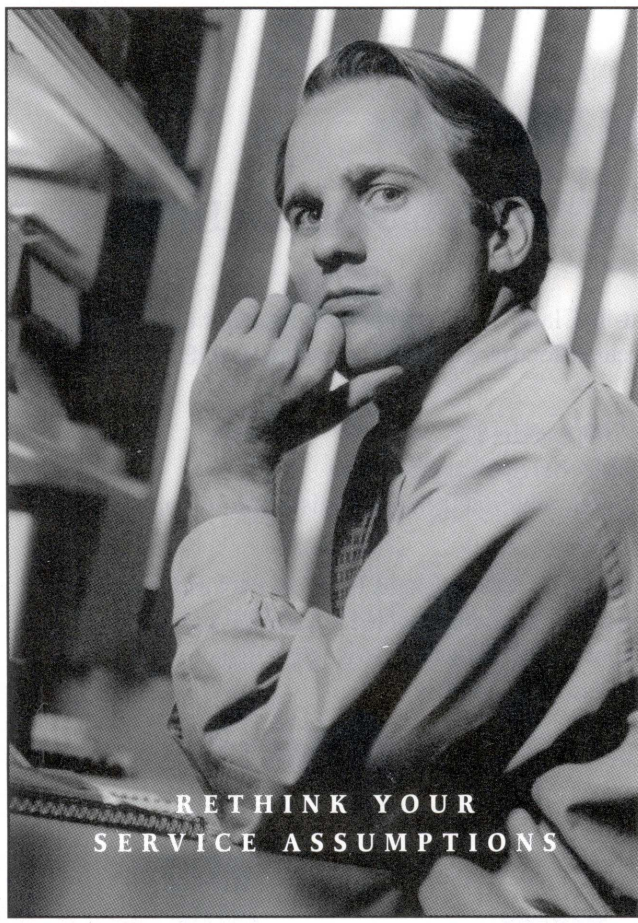
Jconfig allows administrators to configure and manage multiple NFS Maestro Gateway servers from any Java-enabled browser, remotely access and modify any Windows NT Server file, access the Windows NT system registry, modify environment variables, display system information and logoff and reboot the server. Other features of NFS Maestro Gateway include Windows NT Cache Manager support and extended Auto.Map support. NFS Maestro Gateway runs on Windows NT Server Version 4.0. Pricing begins at $196 per seat including maintenance. It is sold in packs of 10, 25, 50, 100 and 200 seats with volume licensing available. A 30-day evaluation version of NFS Maestro Gateway can be downloaded from the Hummingbird web site.

➤Hummingbird Communications Ltd., North York, Ontario at (416)496-2200.

CA Ships Masterpiece/Net

Computer Associates International, Inc. (CA) has shipped Masterpiece/Net, an Internet-enabled version of the Masterpiece financial management suite. Masterpiece/Net integrates with CA's enterprise management technologies and allows access to all Masterpiece/Net functions using any Java-based browser. It is Year 2000 compliant and supports the current European and Monetary Union (EMU) regulations. Masterpiece/Net includes consolidation, general ledger, accounts payable, accounts receivable, fixed assets, purchasing, fund accounting, inventory control, job cost and labor distribution, and query, reporting and analysis tools. Masterpiece/Net is developed and marketed by CA's Prestige Software International, formerly known as CA's Enterprise Financial Management Group.

➤CA, Islandia, NY at (516)342-5224.



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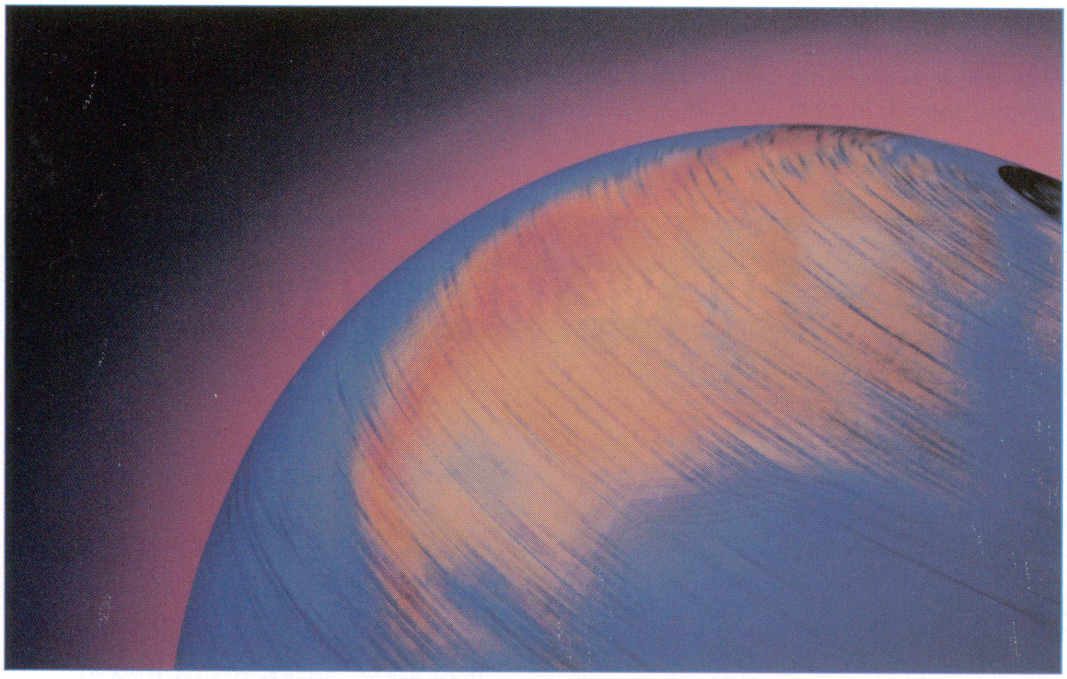
Which parts of the globe are in tune with Y2K-compliance? Is HP off-key?



Dancing To A International Date Change

Come midnight Dec. 31, 1999, the U.S. won't be the only nation with a Y2K hang-over. There are, afterall, other countries and nations inhabiting the planet. Perhaps you're still trying to forget old acquaintances (or recalling hair-of-the-dog remedies); nevertheless, you'll soon remember there's plenty of new acquaintances to make in the global economy. With that in mind, let's take a global perspective on the Year 2000 problem.

YEAR 2000 SPECIAL REPORT

John Harney

In the West, where the U.S. and U.K. lead the way —because they are blessed with financial resources, skilled personnel, and so-called "enlightened" technocracies — Europe, because of socio-political complications related to the emerging EEC — lags on the Y2K front. Eastern Europe, still recovering from wholesale political changes, and Asia, weathering economic instability, are well-behind the Western pack.

And way, way back there, Latin America, whose Y2K awareness (much less compliance) is negligible, consequently. Not surprisingly, HP's own conversion initiatives differ according to geographic region. Because most conversion activity is in the U.S., U.K. and western

Europe, HP's geographic market strategy is to focus there. It's technological strategy is to help customers assess the Y2K readiness of their HP platforms using HP assessment tools. HP will not, however, provide comprehensive Year 2000 conversion and testing products and services. Instead, in 1998 it will offer only one product — for assessment — and will partner with vendors in key areas who'll provide most of the products and methods to accomplish complete customer conversions.

The Gartner Group (Stamford, Conn.), rates countries' Y2K progress. According to Jim Duggan, Research Director, Gartner's Year 2000 Service, a "1" is assigned to a country, if they are ignorant of the problem; "a 2," if they are aware of the Y2K problem and planning to fix it; a "3," if they are fixing the problem; and a "4," if they almost fixed the problem. If the prob-

ARE WE THERE YET?

Today CIOs want, more than anything, a return on their IT investments and expenditures. By now, it's no secret that the arrival of the Year 2000 will raise havoc with the applications of nearly every global corporate organization using IT to run its business. While the cause may be simply that software engineers underestimated the longevity of their own creations, the compelling issue facing businesses is much more complex — namely how to thoroughly and efficiently correct this dilemma before it causes a deluge of technical, legal, and revenue-related nightmares.

One way to achieve this is to view the Year 2000 situation as an opportunity rather than a problem. That is, don't look at the Y2K problem through a myopic lens. Look at it with a wide-angle lens — a big picture perspective, if you will.

FLEXIBILITY IS THE KEY TO BEATING IT

While legacy applications do provide value in many ways, the amount of time and effort needed to administer and maintain them is often overwhelming. In fact, many organizations spend as much as 70 percent of their IT man hours updating and maintaining legacy systems. What's more, legacy applications don't offer the flexibility to be enhanced or changed quickly to respond to changes in business strategy which is the root of the Y2K problem to begin with.

Many organizations are spending astronomical amounts of time and money to rectify the Year 2000 dilemma, but simply place the corrected strategic applications back into expensive, inflexible legacy environments that are hard to maintain and administer, and hard to modify for the next "Year 2000" problem whether it be support for a unified European currency, expanded area codes or combining multiple formats for customer numbers after a merger/acquisition. The key then, moving forward, is finding a way to solve the Year 2000 problem, to reap the benefits of the adaptability of client-server environments, to keep the power of legacy applications, and to ensure future technological agility — all at the same time.

THE NEXT YEAR 2000 SCARE

The Year 2000 problem, is today's crisis-dujour. Unfortunately, tomorrow will bring more challenges and the problems that will need to be addressed will seem just as critical. The only way to prepare for these challenges in advance is to create a flexible environment that can rapidly respond to change in order to support business objectives. From my perspective,I think that dealing with the Year 2000 problem alone, that is, fixing it and putting it back on the legacy system, makes little sense; and in fact, has an ROI of zero.

Instead, I believe that re-architecting and migrating the application from the legacy environment to open three-tier client-server architectures is the right course of action. That way, you not only fix the symptoms of the year 2000 problem, but you cure the illness: an application environment that is unwieldy, costly, and difficult to maintain. You get a positive return on investment. In addition, because re-architecting provides a demonstrable future economic benefit the cost can be capitalized and amortized.

Michael Pehl is CEO and chairman of i-Cube (Cambridge, Mass.). Reach him at mpehl@icube.com.

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ConSyGen

THE LIGHT IN THE YEAR 2000 TUNNEL

What a perfect vehicle the Year 2000 crisis is for the prophets of doom, and how well they are playing their role! The problem is that - in many cases - they may be right. This may be the first time that the traditional IS solution of throwing staff at a problem may not work, or may not work in time.

So - if staff resources may not solve the problem, then what? The answer: software tools, and the more automated, the better! To extend the degree of automation in Year 2000 solutions, ConSyGen, Inc. has released ConSyGen 2000, which automates fully the identification and correction of date fields in JCL, programs, copy members, and data storages for a variety of platforms.

Based on a toolset that automates the entire mainframe-to-open system migration process, ConSyGen 2000 has been developed with the goals of maximizing automation, minimizing client staffing, controlling project costs and timings, maximizing accuracy, and reducing testing. This has been so well achieved that multi-million line Year 2000 conversion projects are now performed fully within one month, conversion is usually done in one day, and error-free testing is done in only a few weeks.

ConSygen 2000 provides:

- automated system inventory of your entire code set, with reports on sizing and all internal entity relationships;
- automated identification of all date fields, with full data-flow analysis of all cross-referenced fields;
- automated confirmation as true date fields for all validated date formats;
- automated correction of all confirmed data fields to client-agreed rules. Correction may be full expansion or windowing, as decided by the client;
- generation of replacement schema and sub-schema, if required, to enable extraction and re-loading of databases;
- generation of data file re-population programs, which also serve as external data bridges.

The main advantages for the client are accuracy, speed, and cost control. Current projects are testing with zero errors, since all changes are made automatically, and are based on agreed rules. This has the direct effect of reducing client testing time dramatically, which in turn reduces the overall project time, the period of change control, and the impact on processing or business operations. Client staffing is reduced in most projects to only two or three part-time staff for only a few weeks.

ConSyGen 2000 converts: All COBOLs running on HP3000, IBM, BULL, Digital, and Unisys mainframes, and all UNIX environments (including HP9000 and RS/6000). PL/1 will be available in early 1998. ConSyGen 2000 addresses all standard file structures, all major relational and non-relational databases, and all major transaction monitors.

Correction may be either by full field expansion in programs and data, or by a variety of windowing techniques. Year 2000 correction may also be combined with platform replacement through the software conversion capability.

Pricing is based on the number of lines of code to be corrected and the correction method, with a sliding price scale for larger projects. Fixed-price quotations are available after completion of a simple questionnaire. ConSyGen also offers a money-back guarantee and warranty as standard in all of its projects.

Summary: ConSyGen 2000

- Full automation of date field identification and correction. No client programming.
- No tools to license or purchase; no staff training; minimal operational impact.
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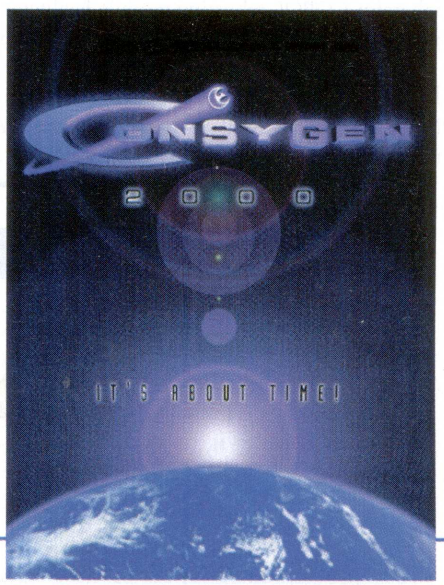

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INTEGRATED YEAR 2000 TOOL SET FOR COBOL

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As the new millennium approaches, corporations large and small face one of the most significant challenges ever to confront the information processing industry - enhancing existing applications to handle the expanded date formats of the 21st century.

ADAPT/2000 Approach

ADAPT/2000 provides an integrated, repository based approach, with code parsing and generating technologies, to address the core phases of the millennium project for HP/3000 MPE COBOL & IMAGE, HP/9000 open systems COBOL dialects, and for COBOL from almost any other platform, including IBM MVS, IBM VSE, Digital VMS,/OpenVMS, Data General MV Series, Any UNIX, AS/400, Unisys, NCR, Bull, Wang, Tandem, Micro Focus and many others. Few tools provide such an integrated approach, where each activity feeds the next, and conversion can be automated across source code, copy members and actual data files.

Modules include:

- Impact/Detailed Analysis - A rules-based module for performing detailed impact analysis on COBOL code, DDL, User Interfaces and JCL. Output includes management level impact assessment reports, resource and cost summaries, and detailed cross-references by program, copy element, database element, data field and line of code.
- Source Code Conversion - a comprehensive rules-based conversion offering that:
  - Places intelligent markers in the source code to identify where an automated change has been or should be made
  - Automatically implements the A2K Date Routine Library calls for fixed or sliding window, date expansion, contraction or encoding remediation methods, with on-the-fly bridging for mixed methods
  - Outputs new source code, and new copy elements for SELECTS, FD's and WS record layouts, based on the conversion rules established.
- Data Conversion, Bridging and Aging - automated generation of COBOL programs to perform data conversion, data bridging and data aging to assist in the conversion and re-implementation, as well as in Y2K compliance testing.
- A2K Date Routine Library - a comprehensive library of routines for performing date conversion, arithmetic, aging, and formatting, with source code
- RAD Tool Set and Code Generation - includes a central data dictionary, report writer, query generator, data browser, application builder and source code editor for building new COBOL applications, and to assist in the Year 2000 project implementation and testing

Value Beyond the Year 2000

ADAPT/2000's rules-based, repository approach and RAD tool set make it an ideal tool for use in any mass code change project, or for developing and deploying new COBOL-based applications across the enterprise. And, the integrated Legacy Liberator COBOL rehosting module facilitates cost-effective migration of proprietary COBOL applications from MPE (and other platforms) to UNIX, NT, and Windows adding GUI front ends and relational DBMS integration.

Legacy Extension Services for the New Millennium

NeoMedia's Year 2000 Division (previously Allegiant Legacy Solutions) provides legacy COBOL migration, conversion, web integration and year 2000 project services to some of the world's leading organizations. NeoMedia's experienced COBOL consultants can be hired to perform any aspect of a client's millennium project, from high level project management, to turnkey impact analysis and remediation.

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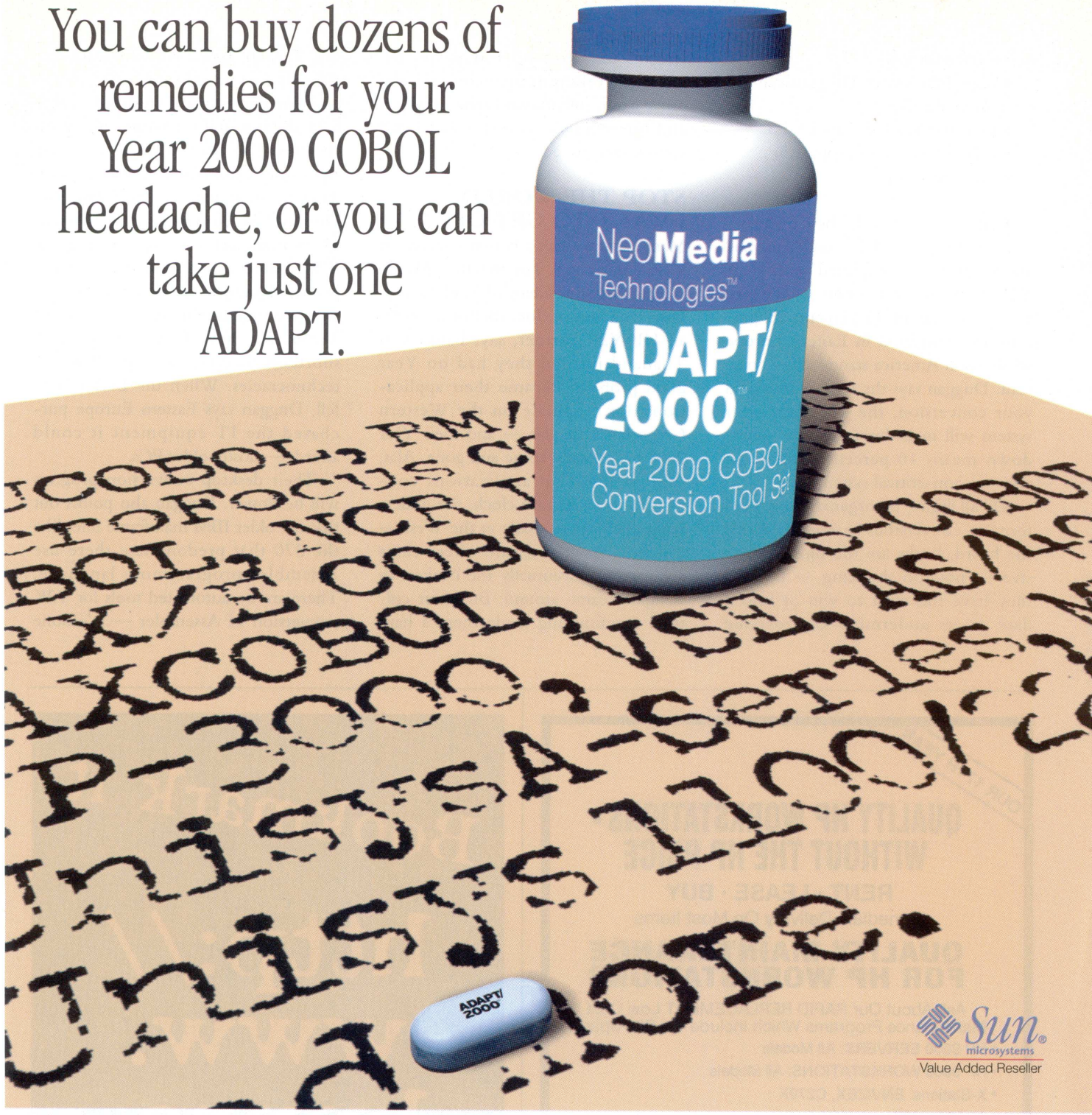

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lem is fixed they get a "5."

Using that scale, Duggan's score card looks like this:

- U.S. and Western Europe 2.5.
- Asia and Eastern Europe 1.5.
- Latin America 1.

Gartner estimates the best organizations in the U.S., U.K. and Australia are 55 percent completed with their Y2K conversions; the best in Western Europe are about 45 percent; 25 percent are completed in Eastern Europe while Latin America stands at five percent. Duggan says the further advanced your conversion, the less likely your system will melt down in 2000 (meltdown means 10 percent or more of your mission-critical systems fail).

Of all kinds of organizations performing conversions in regions across the board, banks are the most aggressive — not too shocking — because they have the most to win or lose if date errors undermine key revenue streams like loan interest payments. Most government agencies, on the other hand, suffer from limited budgets and bureaucratic entropy and can't seem to get started.

STOP THE WORLD I WANT TO GET OFF

Many factors affect a region's success at Y2K compliance. For instance, Monte Rosen, Vice President of Marketing at Data Dimensions, Inc. (Bellevue, WA), an HP Y2K partner, says bankers in Thailand insisted they had no Year 2000 problem because their applications don't operate on the Western Gregorian Calendar — and their Year 2000 had already come and gone. Alas, though the Thai applications conformed to an Eastern clock, the underlying platform — made in the West — did not. And it would affect their applications. Eventually the bankers in Bangkok came around. But their cultural conditioning made them a hard sell. Taiwan, Japan and China also use different Eastern calendars.

Non-democratic regimes create both the best and the worst conversion climates. The best, like Singapore, are rigorously proactive in pushing mandates for compliance. The worst, says Duggan, are convinced that Western IT manufacturers are overhyping the Y2K problem to reap easy conversion profits. Regions like Eastern Europe who are transitioning to capitalism and democracy have had to take some shortcuts to catch up with Western technocracies. When the Berlin Wall fell, Duggan says Eastern Europe purchased the IT equipment it could afford — mostly older PCs.

Their desktop conversion progress will be slower. Duggan also points out that the older IBM mainframe lines like the 370 that predominate there use Assembler programming language. There are no automated tools for Y2K conversion of Assembler — it's done

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Non-democratic regimes create both the best and the worst conversion climates. The best are rigorously proactive in pushing mandates for compliance. The worst are convinced that Western IT manufacturers are overhyping the Y2K problem to reap easy converson profits.

manually and at high cost. In Asia many national economies are suffering from plummeting currency rates. It remains to be seen whether countries like South Korea can spare the funds for Y2K conversions.

And there are idiosyncratic technical issues unique to each region. In Japan, according to Rosen, date formats aren't standardized, so different organizations record dates in different formats and multiple date formats occur in different systems in the same organization. What's more, it's often almost impossible to locate the master index for the date formats. Of course, the worldwide shortage of qualified Y2K programmers affects all regions. The global dynamic seems to be that Y2K experts are flocking to the West from all other regions because the work is here. Where does this leave the rest of the world? Behind the conversion curve.

NO PILL IS GONNA CURE MY ILL

HP's Year 2000 service, "Cure 2000," emphasizes education and service. But HP's Mike Galane, Worldwide Year 2000 Program Manager, emphasizes that the responsibility is on the customer: HP will "enable customers to do Y2K conversions, but there's no broadly available application remediation." In fact, HP itself offers only assessment services and only for HP systems and subsystems. However, they've partnered with application conversion providers like SAP, Y2K process providers (with methodology for assessment/conversion/testing) like Data Dimensions, and tool providers like Acceler8, to avail customers of complete solutions. HP lists all partners on its Year 2000 Web site (*www.hp.com\go\year2000*). All partners are qualified, and partner Y2K products run on HP systems.

Galane says HP is directing most of its Y2K services to markets like financial, telecommunications and manufacturing. Kazim Isfahani, Research Consultant, Year 2000, for the Giga Information Group, says that, like the U.S. Federal Reserve, more central banks in countries like Denmark, the Netherlands, the U.K and Hong Kong are mandating Y2K compliance by member banks. Telecommunications companies like AT&T, says Galane, use thousands of computers to manage all aspects of their business — from call management to billing. And manufacturing companies are hustling towards compliance to hit product shipment deadlines.

John Harney has been writing about information technology for ten years. He can be reached at jharney897@aol.com.

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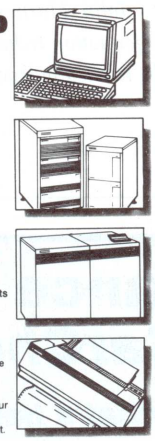

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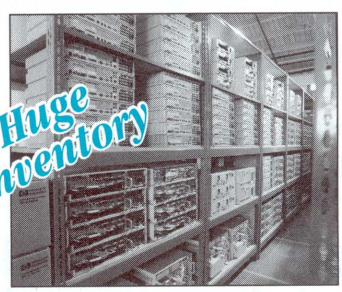

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I/O's New Common Carrier

Driven by the explosion of data in the enterprise, IT professionals are looking at ways to protect their heavy investment in storage subsystems. Traditional I/O busses like Digital's DSSI, Sun's SBus and Intel's ISA are being swept away in the stampede to incorporate PCI. Rarely have major computer manufacturers converged so quickly on a single standard. Today, most PCI adapters are interchangeable in millions of systems from HP, IBM, Sun, Compaq, Digital and more.

PRICE, PERFORMANCE AND OPEN ARCHITECTURE

Why did the industry embrace PCI? First, studies have shown that performance is the number one buying criteria. PCI is a highly parallel 64-bit I/O bus capable of transferring data at a blazing 264MB/s. Second, industry acceptance requires an open architecture. The PCI bus architecture is fully defined by standards groups worldwide. Third, as manufacturers build millions of identical PCI expansion slots into their computers, bus adapter designers are furiously introducing products to fill them. The kinds of adapters available are too many to name, but a few examples are network, RAID and Fibre-Channel. And thanks to fierce competition among hundreds of vendors, the power and quality of the products are extremely high. At the same time, competition and an abundant supply have kept the costs extremely low. The tangible benefits of the PCI standard to IT buyers are open standards, high-end functionality and low-end cost.

WHAT'S IN STORE

You can extend the capabilities of your computer by replacing or adding PCI network and bus adapters. For example, wouldn't it be nice to open up the pipe to your tape library by upgrading the SCSI interface to Fibre Channel? Wouldn't it be nice to perform the upgrade by simply changing a PCI adapter? Companies like ATL Products are introducing the concept of extendible, "future proof" storage with subsystems incorporating a PCI expansion bus. This offers a path to Network Attached Storage (NAS) not available from proprietary I/O busses like DSSI. With 264MB/s bandwidth, PCI-based storage systems offer performance SBus can't provide for your Fibre Channel Storage Area Network (SAN) of the future. And PCI-based Network Interface Cards, at less than $50, already offer the low cost of ISA cards.

CompactPCI brings an exciting twist to storage systems — the ability to configure a turn-key storage server appliance by adding a PCI single board computer. This is possible because single board computers with Pentium, SPARC or Alpha CPUs are available for storage systems incorporating a CompactPCI port. It is electrically a superset of desktop PCI with a different physical form factor, namely, the Eurocard popularized by the VME bus.

Some PCI single board computers even include disk drives mounted right on the board. This allows you to layer operating system and applications software to meet a variety of specific needs. For example, if you wanted to configure a cookie-cutter automated backup appliance for deployment across your enterprise, you could plug a single board computer into a tape library and preload backup software on the disk drive. The end result is a turn-key appliance that's easy to install and easy to upgrade.

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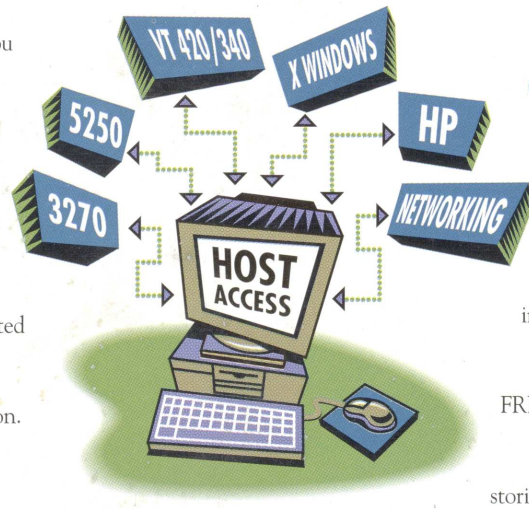

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